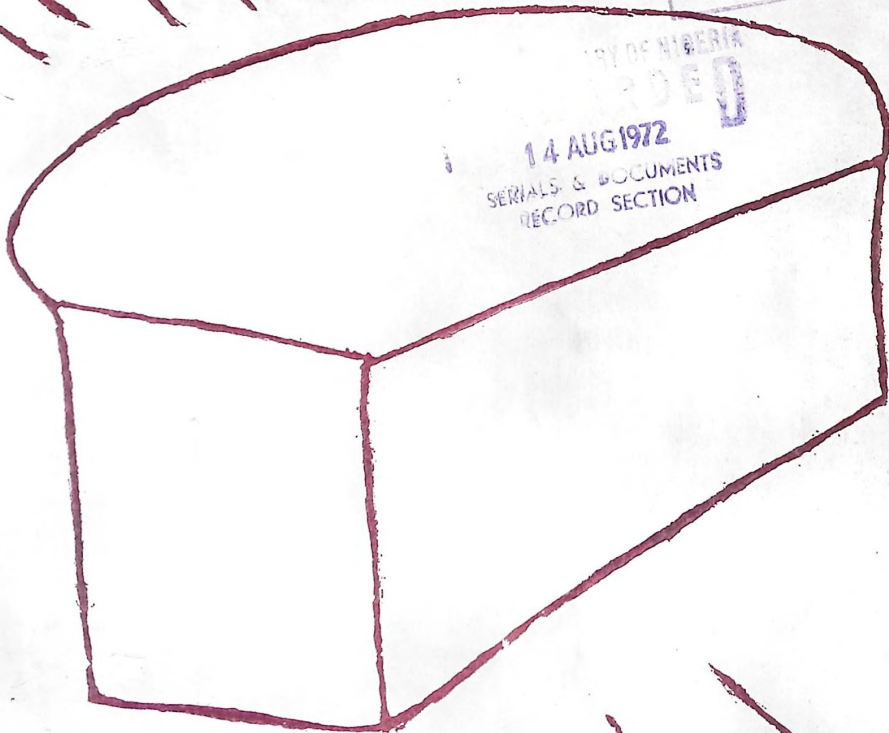


# FARMSTOCK

stockbreeders' monthly

NEWS, SALES & ADVISORY SERVICE ON •POULTRY •PIGGERY •DAIRY ETC.



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# FARMSTOCK

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# PLANNING A LAYING UNIT (I)

ONE of the most important factors in successful poultry farming is good planning. This is true both for someone who is thinking about starting a poultry farm and for someone who has a farm already and is trying to make a success of it.

lay when old birds are ready for replacement. From the time one orders day old chicks to the time they come into lay must be at least six months, so one has to think ahead.

To plan production to meet demand it is necessary to know how a bird will lay during its life. Breeders publish details for their own particular hybrids, but all birds follow a similar pattern, coming into lay when the birds are about 19 weeks old.

Production rises to a peak of over 80 eggs per 100 birds

Planning should start from three points.

- (i) How many eggs can I sell, and at what times of year ?
- (ii) How much money should I invest in egg production ?
- (iii) What kind and size of poultry unit can I manage most successfully ?

The first of these three is the most important. To produce eggs is foolish unless they can be sold, so planning begins with making an estimate of how many eggs can be sold and in what ways.

If the demand for eggs varies according to the time of year, make allowance for that in planning the farm. For example if eggs sell better in the dry season plan to have more eggs at that time and less in the rainy season.

Perhaps the small eggs hens lay when they first come into lay are easier to sell at one time of year. Then most of the hens could come into lay at that time.

One of the most important objectives is to keep one's customers. If a farmer has no eggs for some time they will go somewhere else, and perhaps not come back. So it is important to be sure there are eggs when they want them.

Planning is necessary to get new day old chicks to be reared and come into

Here are two examples of farm plans made to meet customers' demand for eggs.

## PLAN A

This plan is to meet a steady demand for eggs all the year round. It is based on one rearing house supplying three laying houses in turn. Day old chicks are ordered sufficient for one laying house every 20 weeks. At 16-17 weeks the first lot

The plan gives a fairly level supply of eggs through the year. Egg size varies more than egg numbers, but is sufficiently well balanced not to make too much of a sales problem. The biggest disadvantage of this plan in Nigeria is that the old layers are for sales only three times a year, and so new customers have to be found every time.

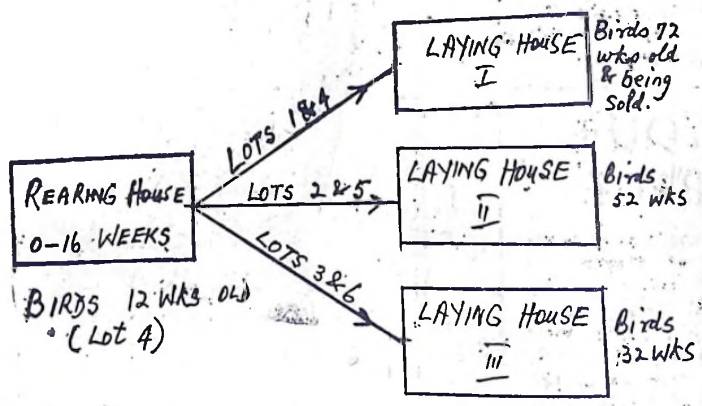
Also unless the birds happen to be sold at festival times it may be difficult to get a good price for them or to clear them quickly enough to make room for the next lot.

Doubling this system to make two rearing houses taking birds in turn at ten week intervals, and six laying house makes egg size and

L. J. Elmslie M. A. (Cantab)

Specialising in Agriculture

Technical Director, Ejinaka & Thornber Ltd.



per day between 27 and 32 weeks and after that falls slowly but steadily to reach about 50 eggs or less per 100 birds per day by 70 weeks old. Production also varies, naturally, according to breed, feeding, management and disease. Sales also vary, so we do not try to plan to the last egg, just to be as near to meeting our customers' needs as possible.

are moved to the first laying house, the rearing house is cleaned and got ready for the second lot.

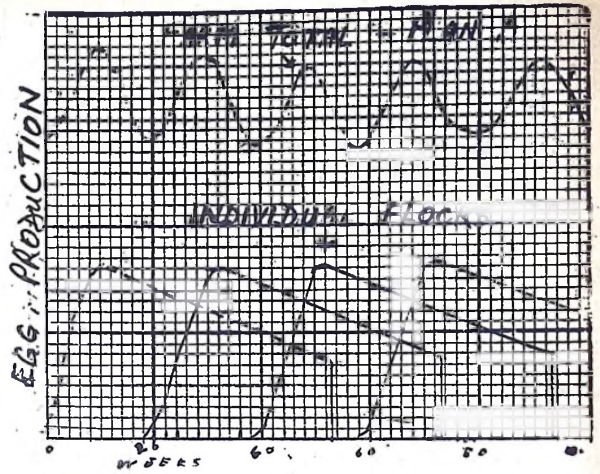
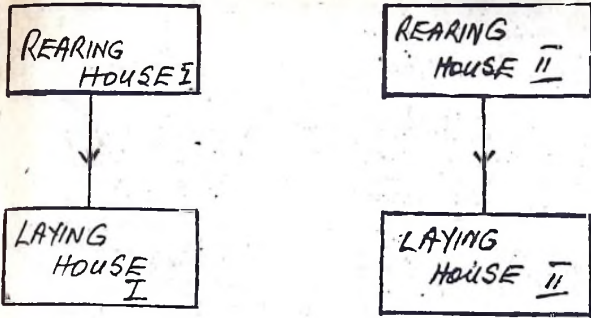
When they in turn reach 16 weeks they move to the second house, and the same happens for the third lot. A fourth lot of chickens is started in the rearing house, and the first lot now at the end of their lay are sold off to make room for them.

bird sales more level through the year, but it also makes the system too complicated for convenience.

## Plan B

This plan is to take advantage of higher prices for day old layers at one time of year, but allows for

Continue on page 22



eggs at all times to keep regular customers happy.

There are two laying flocks in plan B. They are hatched at the early part of the rainy season, one two to three months earlier than the other. The first lot comes into lay in the late rainy, or early dry, season. The second lot comes into lay about New Year. The old birds from the first lot may be sold at harvest

festival time, and those from the second lot for Christmas or New Year celebrations. Birds housed on this plan should get bigger prices for their eggs and as old layers.

Continue on page 22

## BE LIKE HER

NOT FOR THE WANT of what to do but for its ignorance many young girls, ladies and woman who should find gainful employment on the farm personally owned by them, a private or government sponsored venture are waiting... waiting and waiting for a job that is not forthcoming.

Why not be like charming Marian Okulaja seen her in an English Farm feeding three-day-old chickens:

Now studying for a Diploma in Poultry Husbandry at Harper Adams Agricultural College in the English Midlands, pretty Miss Okulaja will soon return to the country to be admired and perhaps envied by the waiters.

You may not go overseas before starting; there are many experienced poultry keepers in the country from whom you can learn. Start today to prominence.



# CONQUEST OF MOSQUITO IN SIGHT

Entomologists in the United States are edging closer to control of the mosquitos. The U. S. Department of Agriculture recently cited new progress in the campaign against these insects which thrive in many parts of the world.

After testing 249 experimental repellents, Agricultural Research Service scientists have found 12 that are effective for more than 100 days. One of these 12 compounds, an acetamide, repelled yellow-fever mosquitoes for 266 days.

The new repellents differ from the older repellent (DEET) which is used directly on the skin. They are considered ideal for use on hat visors, collars or mosquito netting.

X X X

## U. S. HELPING EMERGING NATIONS ENRICH FOOD PRODUCTS.

U. S. efforts to help meet the need for protein-rich foods in the developing countries were outlined to the United Nations Economic and Social Council by Ambassador Arthur Goldschmidt.

About 300 million children in the developing world suffer from a lack of proteins, which are important to their growth.

Ambassador Goldschmidt said the United States is trying to improve the protein quality of existing cereals and sponsoring research to develop new foods rich in proteins.

"We are working with private industry to produce and market nutritionally rich foods and we are actively encouraging and assisting the developing countries

Department of Agriculture scientists have also learned that fungus disease of mosquitoes, though not widespread, are effective killers of these pests in certain areas of the United States.

"Fungus disease can kill at least 18 kinds of mosquitoes," the entomologists said. "The most important fungus disease attacks mosquitoes in the larva stage, usually killing them before they mature."

Nematodes, microscopic roundworms, also have been found to be natural enemies of the salt-marsh mosquito. The nematodes can kill their insect hosts when the parasites burst out of the mosquitoes' bodies to mate and lay eggs. Nematodes attack at least 30 kinds of mosquitoes' bodies to mate and

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themselves to expand their production and use of such foods," the U. S. official said.

Council members sampled some of the new protein products being produced and marketed in developing countries as a result of American initiatives. Mr. Goldschmidt noted that all the materials used in the foods came from the countries in which they were marketed. "Nothing but the techniques are imported to produce them," he said.

The U. S. Agency for International Development has provided grants to private companies to study potential demand for protein-enriched products in areas where they are needed, Ambassador Goldschmidt said. In 1967, for example, five companies were given contracts to develop protein beverages and other food products from soy beans and fortified wheat and maize in developing countries.

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Additional research is needed to determine the potential for producing large quantities of nematodes in laboratories, and spreading them to various mosquito breeding areas.

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### KAINJI FISH

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The State's Ministry of Agriculture is directing operations and fumigants, sprayers, insecticides and personnel have being supplied to cope with the infestation.

The insects are reported to be eating tree leaves, shrubs and grasses but crops in comparatively small areas.

However, it is feared that they may pounce on crops when they have nothing else to eat.

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THE Benue State Commissioner for Agriculture and Natural Resources, Mr. I. N. Shaahu has been visiting U. S. Agricultural Centre to familiarize himself with modern systems.

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The commissioner hopes to apply the techniques he had seen to improve agriculture in his State.

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The Emir enjoined the recipients to uphold chastity and selfless service.

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THE Kabba Progressive Farmers' Association has appealed strongly to the Commissioner for Trade and Industry, Mr. S. B. Bandle, to explore the possibility of opening a bank for them in Kabba.

# THE FLY PROBLEM (I)

## AND ITS CONTROL

by Our Sanitary Correspondent

**F**LIES have been known as very deadly human parasites by early man. Much of human and animal suffering—loss of health and fall in livestock and harvest—are traceable to flies—the commonest of which is *Musca domestica*; young school children know them as disease carriers, people with uncovered sores often in a bid to kill the offending fly that has just given them a prickly bite, have so spanked their sores hoping to kill the fly but thereby set their wounds bleeding; they go on causing the offending fly.

For dairymen, maintaining a low bacterial count is of prime importance in milk production. They must see to it that flies are eliminated around their operation.

In cattle pens around pig raising operations, and wherever livestock are kept, farmers have found through long experience that flies not only carry disease but reduce livestock health and cut into farm profits to the tune of several thousands of pounds a year.

vegetable refuse heaps and other similar places.

And it takes only 6 to 12 hours for eggs to hatch into dirty white larvae (maggots). After feeding on the substance on which eggs were

There is no simple solution to all fly problems. In order to know what to do about flies it is necessary to understand something about the life cycle and activities of flies—what materials produce flies, which kinds of flies bother people, how to eliminate fly sources, and how to destroy flies.

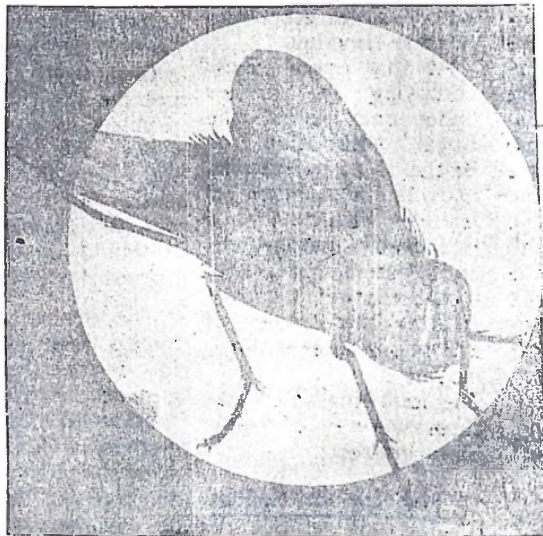
### Why worry about flies?

It has been known for many years that domestic flies are able to carry various diseases. One of the most important fly-borne diseases today are the bacillary dysenteries. Flies feed indiscriminately on human or animal excrement, garbage or the food on your table.

Their hairy bodies and legs as well as feeding habits make them ideal carriers of germs.

When flies occur in large numbers their presence alone may be very annoying. Damage to homes may result from continued depositing of fly specks. Fly presence causes repeated fly-specking and cause decreased proper values.

*In the next instalment, life history of a fly is discussed.*



### The House Fly Cycle

Houseflies are natural carriers of bacteria because of their structure and habits. Their bodies, legs and mouth parts are covered with hairs; their feet have a sticky fluid and their mouth parts are damp.

The females deposit eggs on the surface of animal manure, waste around feed troughs, refuse in garbage piles, leaking septic tanks,

deposited, the larvae will mature in 4 to 7 days in warm weather and somewhat longer in cold weather. Full-grown larvae usually migrate to the drier outer surface of the media to pupate.

Adults emerge from the pupal case in 4 days to several weeks depending on temperature and weather. They generally live from 30 to 60 days during warmer months. Some live through the wet season.

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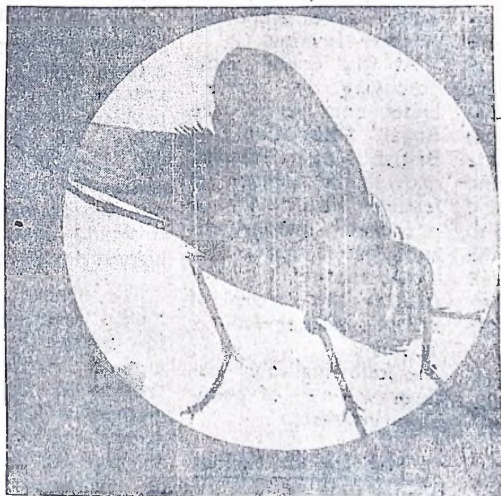
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# HEIGHTENED INTEREST AT 1968 ROYAL DAIRY

AGRICULTURAL SHOWS IN THE UNITED KINGDOM HAVE, OVER A PERIOD OF SOME 160 YEARS, MADE AN IMMENSE CONTRIBUTION TOWARDS AGRICULTURAL PROGRESS, BUT TO THE DELIGHT OF MANY AND THE REGRET OF FEW THE CHARACTER OF SHOWS IS CHANGING RAPIDLY.

The days when the annual Show was mainly a social occasion are rapidly disappearing as were events staged purely as public entertainment. The trend is now towards shows of a more permanent kind with demonstrations and features designed to educate and assist the commercial farmer in his constant efforts towards attaining greater economic production.

Planned use of capital, maximum use of existing buildings and equipment, the use of suitable machinery leading to a reduction in labour, the performance of livestock by adoption of improved husbandry—these are the more important standards of the modern agricultural Show.

## Farming Economics

The Royal International Dairy Show is typical of this development. This year's Show, held at Olympia in London recently concentrated more than ever before on that

most important of all factors, the economics of dairy farming.

At that unique Show occupying 14 acres under one roof, the Royal Association of British Dairy Farmers provided a number of features leading to improved management and greater productivity - vital to the future stability and success of British's greater dairy industry.

The following four features were of particular interest:

### 1. Planning for Parlour Milking

The increase in the size of dairy herds continues demanding even more skills from milkers and a new approach by management. Unless considerable forethought is given to the planning of the routine work each milking can be a strain for both cows and milkers.

Practical ways of simplifying work in any parlour was demonstrated. They included an electric dog, a

backing gate, herring-bone parlour designs, management charts and aids to udder washing.

### 2. Disposal of Farm Effluent

With the continuing intensification of livestock units, the disposal of farm effluents, particularly cattle slurry, has become the most acute problem of many farms today. Far too often the disposal of farm waste received little or no consideration when it should demand the highest possible priority.

The exhibit aims to help livestock farmers to decide the best method of handling in relation to farm type, method of housing and quantity to be handled. A range of equipment for dealing with liquid, slurry and solid manure was shown and basic information on costs, working rates and other economic factors were presented.

### 3. Beef from the Dairy Herds: The Economics of Calf Reading for Home Produce Beef.

The annual slaughter of nearly 750,000 calves is a waste which neither the nation nor the farming industry can afford. In many other countries there is simi-

lar waste and the problem is therefore international importance.

This demonstration staged to encourage changes and improvements by dairy who are in a



Sir Richard Trevelyan, President of the Royal Association of British Dairy Farmers, and Chairman of the Milk Marketing Board.

to make a major contribution to the meat supplies.

In the rearing of calves from the dairy for both veal and beef emphasis would be placed on the avoidance of mortality at and after birth, and the economic different systems of feeding and culling different breeds.

# NATIONAL APPEAL DAIRY SHOW

## Profits from Sheep

The Sheep Industry has been facing a difficult period as many old traditional methods are becoming unprofitable. There are several factors governing the profitability of sheep. At the 1968 Show low-cost housing and indoor feeding, heavy stocking of grassland and systems of economic management were exhibited as essential parts of policies designed to achieve fast growth rates and well fleshed carcasses to suit the consumer.

Apart from these important demonstrations there were many other sides to the Royal International Dairy Show.

This year was the second occasion it had been staged as an international event.

Several new trade exhibitors from the European mainland, also from the Province of Quebec and from Eire exhibited for the first time. The number of inquiries received from overseas visitors who attended this year was higher than ever before.

## Cheese And Butter

This year the Royal Association has introduced classes for hard and blue cheese, butter and milk powder in which manufacturers from any country could enter. They have attracted satisfactory entries and

it was believed that, once established, they would become popular and important features at future Shows.

The possibility of extending "open" classes to other sections of the Show is under serious consideration by the Royal Association's Council, also in the produce section two classes, open to manufacturers in Britain, were introduced for yoghurt - one with a milk fat content of not more than 1.5 per cent, the other containing not less than 3 per cent. milk fat. This was the first time that classes for yoghurt have been staged in Britain.

The Show was of course renowned for its dairy cows and heifers. All the important dairy breeds for which Britain is renowned - Dairy Shorthorn, Ayrshire, British Friesian, Jersey, Guernsey Red Poll and Red and White Friesian - were represented.

The overall entry was 459 compared with 544 in 1967. This drop of about 20 per cent. was anticipated and was due to two causes:

(a) The Ministry of Agriculture's Brucellosis (Accredited Herds) Scheme and

(b) Last winter's tragic outbreak of foot and mouth disease.

Because of the Brucellosis scheme the Royal Association provided three separate sections of stalling at the 1968 Shows:-

(1) accredited; (2) controlled and supervised and (3) non-designate. Under the scheme accredited cattle returning from the Show have to be isolated.

This has meant that several regular exhibitors have decided against showing until such time as the Show is open to cattle from accredited herds only, when the isolation requirement would no longer apply.

The Royal Association hoped that this would be in 1969. Several other herds which have been represented at Olympia for many years regrettably, were missing on this occasion. This was because they were destroyed during last year's foot and mouth epidemic.

## Beef Hall

The opening of the Beef Hall has added immense interest to the Show and well over 100 head of beef cattle were exhibited. All beef cattle were judged as meat

animals to suit marketing requirements.

Following the judging in the beef classes the cattle were sold by auction on the Wednesday.

Pigs (heavy, bacon, pork and cutter) made up an important part of the Show. This section was regarded by leading breeders as the finest pig show staged in Britain today. The same could be said of the bacon where 150 sides were hung.

Veal was introduced to the Show several years back and the number of entries had increased annually. This year two classes (each in 2 sections) were provided in each 60 carcasses could be accepted.

Few shows could be of such interest to progressive dairy, beef and pig farmers, also to all those engaged in the processing and distributive sides of the dairy industry. But there was also much for the townsman to see. There were several thousand poultry, pigeons, and rabbits.

There was also a delightful horticultural section and over 150 floral arrangements always a great attraction to the general public.

# WHAT IS BREAD? (I)

**NIGERIANS** seldom think of what type of bread to buy. Bread is an imported food. It was brought in by early trading vessels from which the coastline of

opinion is that she is giving them a tasty and nourishing stuff.

Since she does not know how to bake bread, she

taut amino acid-lysine, so very necessary for the body, is destroyed and so one loses one of the many valuable proteins in the grain.

Sugar by itself has no vitamins and minerals which are essential in any food. The more sugar that is added to any food, the more is the loss thus caused in the heat giving, properties of other valuable materials in the food.

The starch which makes the greater percentage of grain, is swallowed after chewing without being broken down into the form that can be absorbed by the body, that's why one usually feels heavy after taking sweetened bread. On account of this, experts on food conclude that sugar in bread hinders the body from absorbing the nourishment in bread.

It should also be noted that white bread is baked from 'refined flour'. Refined flour is flour that has been rid of much of its nourishment. In the process of

An analysis of  
**BREAD**  
by Our Dietician

West Africa acquired the skill of making it and gradually the relish for bread spread inland.

confides in the baker to give her just what is good for her family.

Because of this common

It has been noted that our saliva changes automatically with whatever we eat, in other words, our salivary glands produce different kinds of saliva according to the

The colonial masters used to dress in white suitings, they kept their house clean and anything that went near the colour white was made spotlessly white. So gradually the colour of white became attached to good things. The stewards who served Europeans also must have noticed that the foreigners soup was invariably white.

ignorance about bread, it will be worthwhile to discuss bread in toto.

**The quality of bread**

Questions have revealed that shop keepers stock the bread people ask for. The popular bread is determined not by its nutritional value but by its taste (sugar) and wrapper. "The more colourful the wrapper, the better the bread must be" so most people think.

But baking standards notwithstanding all breads are not equally nourishing. Most bread loaves offered for sale in this country are not nourishing at all. They only fill the stomach.

As mentioned earlier, taste is the most important factor to the Nigerian bread buyer. Little does he realize that it is the sugar in the bread that actually robs the bread of its food value. When sugar is mixed with bread, an impor-

food in our mouth. Thus, when one eats a sugary bread, the sugar stimulates the saliva that can break down sugar.

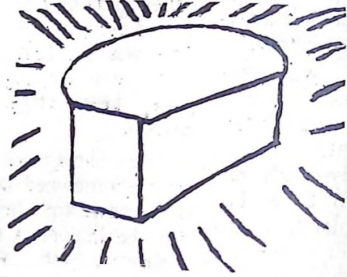
This happens because the taste of sugar is first felt but since two types of saliva cannot come out of the glands at the same time, the starch in the bread is left untouched by the gland.

'refining' flour two harmful things result. One is the removal of the outer part of the grain which is usually brown.

part of the grain is a thin layer which is highly proteinous. As the grain is juggled the germ which is mainly protein and oil, is also removed.

In short, refined flour which is usually white has neither the aleuronic layer nor the germ. Since these two are absent in refined flour, it follows then that refined flour has less proteins and vitamins than unrefined flour. In effect refined flour loses its nutritive value but gains whiteness

**ARE YOU BUYING THE RIGHT TYPE OF BREAD?**



Closely laid on the outer

Continue on page 14

# WHAT IS MILK ? (2)

## HOW DOES IT HELP YOU?

### CHEMICAL COMPOSITION OF MILK

**T**HE essential chemical constituents of human milk and the milk of some other species are set out in Table below. The figures for human milk are mostly derived from the thorough study carried out in Great Britain by Loh and Mawson (1950).

But studies in the U.S.A. (Macy, 1949), Johannesburg (Walker et al., 1954), Nigeria (Jelliffe, 1952) and in India (Gopalan, 1958) all show that although there may be wide variations in the nutrient content of individual samples of human milk, the general picture is the same throughout the world. Except for its vitamin content, the composition of human milk appears to be largely independent of the state of nutrition of the mother.

Even after prolonged lactation for 2 years or more, the quality of African women's milk appears to be well maintained, though the quan-

tity produced may be small.

Severely undernourished women in times of famine often manage to feed their babies surprisingly well.

The proteins are perhaps the most important nutrients in milk. The principal protein is caseinogen; but lactalbumin is also important; in human milk it provides about half the protein, though only about one-fifth of the protein in cow's milk.

Milk also contains about 40 to 80 mg./100 ml. of non-protein nitrogen (Hytten, 1954). The biological value of milk protein is very high. It will be observed in Table below that human milk usually contains less than half as much protein as cow's milk.

For this reason cow's milk should be diluted before feeding it to every young infants. About 20 percent of the caloric value of cow's milk is provided by protein, as compared with only 6 to 7

percent in human milk.

As judged by the approved standards human milk is thus a poor source of protein. The small quantity of protein in human milk is evidently most efficiently utilised.

It has been shown that human milk contains an essential nutrient for bacterium *Lactobacillus bifidus*.

This nutrient is not found in cow's milk. It is a nitrogen-containing polysaccharide with a high hexosamine content. The biological significance of this substance for the young infant is not known, but it is interesting that the prevailing micro-organism in the faeces of normal breast-fed infants is *Lactobacillus bifidus*.

By contrast, the faeces of infants-fed on cow's milk contain a great variety of organisms. The faeces breast-fed infants are acid, whereas the faeces of infants-fed on cow's milk are usually alkaline or neutral.

Perhaps the intestinal flora favoured by human breast milk aids the efficient utilisation of its protein.

The fact in freshly secreted milk is present in fine globules, many of which are very small indeed in diameter. Fat in this form is particularly easily digested. When milk is left to stand these globules run together to form cream. The fat content of human milk varies greatly, as does that of cows.

In some mammals the fat in this form is particularly

In the first instalment to the food value of milk both young and old was discussed.

In this instalment, the ingredients of milk are analysed.

easily digested. When milk is left to stand these globules run together to form cream. The content of human milk varies greatly, as does that of cows.

In some mammals the fat content of the milk is very high. The milk of whales and sea lions, for instance, contains over 40 percent of fat. In these, lactation lasts for a very short period, during which the mothers cannot feed.

The milk transfers an enormous quantity of fat from the mother to the young in the course of a few days. Elephant's milk contains 20 percent fat and reindeer milk 17 percent.

The carbohydrate in all milks is lactose. This sugar is much less sweet than cane sugar. Human milk contains more lactose than cow's milk. Cow's milk is frequently 'humanised' by diluting and then adding cane sugar or glucose. The young infant thus becomes accustomed to an unnaturally sweet food at an early age.

Calcium is present in all milks in good quantities. Human milk usually contains between 25 and 35 mg./100 ml. Cow's milk contains about 120 mg./100 ml. The calcium is present chiefly in combination with caseinogen.

For some unknown reason milk also contains significant

Continue on page 16

Typical analyses of milk from various species  
(All values in g./100 ml.)

	Carbohydrate	Protein	Fat	Calories
Human	6.8 (6.2-7.6)	1.5 (0.6-2.0)	4.0 (2.0-6.2)	68
Cow	5.0 (4.2-6.8)	3.5 (2.5-4.0)	3.5 (3-6)	66
Buffalo	4.5	4.3	7.5	103
Goat	4.5	3.7	4.8	76
Ewe	4.9	6.5	6.9	109
Mare	5.7	1.3	1.2	29

**MILK**

amount of citric-up to 0.23 mg./100 ml.—which must reduce the ionisation of a small part of the calcium.

Nevertheless the calcium in milk is generally more readily absorbed than that in other foods, probably because of its combination with amino acids. *Milk is thus a most valuable food for the formation of bone.*

**Phosphorus** is found in human milk in concentrations of 10 to 20 mg./100 ml. Cow's milk may contain 100 mg./100 ml.

**Iron.**—Milk contains very little iron. All milks provide 0.1 to 0.2 mg./100 ml. Young mammals depend for their initial supply of iron on stores accumulated during intra-uterine life.

In the human infant these stores are sufficient for only 4 to 6 months, and if iron is not then provided in the diet anemia is likely to follow.

**Vitamins.**—The vitamin content of milk often reflects the vitamin content of the mother's diet. This is important in the case of thiamine.

**Thiamine.**—Infantile beriberi is liable to occur in breast-fed infants when the maternal diet is deficient in this vitamin. The thiamine content of mother's milk in Europe and North America falls within the range of 10 to 20 ug./100 ml. Once lactation is fully established, though in the first 14 days of lactation it may be less. Cow's milk contains about 45 ug./100 ml.

It has been established that the thiamine content of the milk of Eastern women with healthy babies also falls within this range. But the milk of some women whose infants were believed to be suffering from beriberi contained very small amounts of

thiamine—0 to 6 ug./100 ml.

To raise the thiamine content of the milk of these women to a level safe for the children (15 ug./100 ml.) a supplementary supply to thiamine was necessary.

**The Riboflavin** content of human milk in early lactation about 20 ug./100 ml. Cow's milk may contain 200 ug./100 ml. The riboflavin content of milk seems to be very much dependent on the dietary intake of the pregnant woman or animal.

**The Nicotinic Acid** content of milk has been little studied. It was detected that European women in Johannesburg gave milk with a nicotinic acid content between 110–300 ug./100 ml. but Bantu women's milk contained 15 to 140 ug./100 ml. Cow's milk contains about 100 ug./100 ml.

Provided the mother's diet is not grossly deficient, human milk is a satisfactory source of the B group of vitamins, as also is cow's milk which, in small quantities, will usually cure angular stomatitis, glossitis and other conditions associated with riboflavin and nicotinic acid deficiency.

**Ascorbic Acid** is usually present in the milk of British mothers in amounts between 2 and 5 mg./100 ml., so that their infants may receive up to 50 mg. daily, which would appear to be more than adequate. Cow's milk contains much less—only about 1 to 2 mg./100 ml.

This small amount is easily destroyed by pasteurisation and boiling of milk or allowing it to stand in sunlight. Cow's milk is thus a relatively poor source of ascorbic acid,

and infants fed solely on cow's milk must be given a supplementary source of this vitamin.

**Vitamin A.**—British mother's milk usually contains 25 to 45 i.u. of vitamin A/g. of fat and in addition a small amount of carotene. Unless the mother's diet is grossly deficient breast-fed infants appear to receive a sufficiency of this vitamin.

Keratomalacia is very rare in breast-fed infants. Cow's milk has a vitamin A content which varies from 70 to 150 i.u./100 ml. It is higher when the cows are out in good pastures than when they are stall-fed.

**The Vitamin D** content of human milk has been little studied. A recent report reckons it to be between 0.13 and 0.41 i.u./g of milk fat.

Continued from page 14

**BREAD**

Because of the attraction of white some flour producers even often go to the extent of bleaching the flour. Acids, such as chlorine, nitrosyl chloride or benzoyl peroxide are added. These further whiten flour. In place of the losses—vitamins and proteins—they add iron, calcium and some trace vitamins. In all, the flour is affected by about fifteen different drugs before it is ready for baking.

A recent report on this practice says it is questionable to remove something and later try to put it back. Although these properties may be returned, their mixture can never be the same as a natural blend.

As many as have come to know the different kinds of flour so many have wondered why so much unwholesome bread is sold. The answer is simple. On most edible things,

vision controls taste and taste in turn controls value. In many cases, when vision is eliminated as in tobacco, taste controls value. Thus, the colour which appeals to many as being clean overrides other properties.

**HEALTH GIVING BREAD**

Leading dietitians say that bread that is baked from whole grain, without addition of sweeteners and preservatives, is the best bread. It should be eaten together with other suitable foods, such as certain vegetables that help the body make use of all the nutrients of the full-grain bread.

Interestingly, bread that was baked in many places during the second world war, when a shortage of raw materials forced many to grind the whole grain, was more healthful than much of the bread that is baked today. The reason is that whole-grain bread contains two to seven times more of

the necessary vital substances and minerals than ordinary white bread."

**SOURDOUGH BREAD THE BEST**

As many often do, one may wish to know the most nutritional bread. Bread has an ancient ancestry. The origin is from leavened or sourdough bread baked according to a recipe that is so sold that no one knows exactly when it began.

Historians know that it was used by the ancient Egyptians, Jews and Romans. The Bible also speaks a lot about leaven and leavened bread. Leaven was the fermenting agent used by ancient peoples, and nutritional researchers can guarantee that for thousands of years such bread had good reason to be called the 'staff of life.'

This is because of its very high nutritional value. By the way, smell the delicious aroma of the rich flavoured grain in this cake.

# MILK IS GOOD FOR YOUNG PIGS

A regular dose of milk given to young pigs has proved beneficial. These pictures show how to help the young animals.

X X X X X

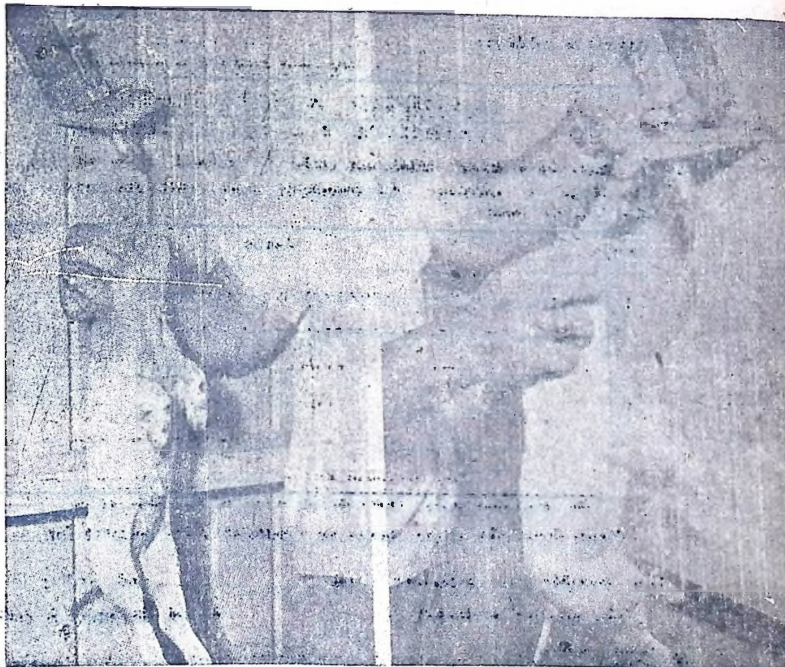
In picture on the right milk warmed to body temperature is drawn through a small tube into a syringe.



● THE pig is held vertically, the mouth forced open by squeezing with thumb and finger. The tube is lightly forced about 3 inches down the throat. Most pigs swallow as the tube reaches the back of the mouth.

● MILK is forced into the stomach by pushing the plunger of the syringe.

Placing the syringe in the holder allows one handle the feeding unaided.



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**P**ASTURE is the cheapest feed for sheep, so make full use of it. Sheep eat a wide variety of grasses, but prefer those that are short and fine.

Native grass mixed with other grasses, such as clover, fescue, and orchardgrass, is excellent pasture for sheep.

A top dressing of nitrogen on grass will insure extra early growth. One acre of well-established grass, properly managed and fertilized, is enough to graze five or six ewes. If pasture is unimproved, 1 acre may carry only two or three ewes.

Start grazing grass when the new growth is 3 to 6 inches high. No other feed is necessary when grass is young and abundant.

Do not rely on grass alone for pasture. When it begins to dry up, put your sheep on temporary pasture.

Good-quality legume hay, preferably alfalfa, is the best in-door feed for sheep. It contains the needed proteins, vitamins, and minerals. If you feed mixed or grass hay, you should include protein supplement (linseed or soybean meal) daily with the hay to balance the ration.

Three to four pounds of alfalfa or other hay a day is enough for a ewe weighing 140 pounds or less. Start to feed hay as soon as ewes are taken off pasture in the fall and continue to feed it until ewes are back on pasture after lambing.

Hay is usually fed for about 5 months, but the length of time will vary with the season and kind and amount of pasture available.

Most of a sheep's living comes from pasture and hay. Grain is fed only at certain times during the year. Ewes generally need grain about 100 days. They should have grain 30 days before lambing. If ewes nurse lambs after lambing, continue grain

daily until spring pasture is available.

One-half to three-quarters of a pounds of grain a day per ewe is enough. Feed the grain that is most economical for you. Ground shelled corn is an excellent feed for sheep, especially, if you want them to gain weight. Ground oats and barley also are satisfactory.

If you buy a ram to breed your ewes, get him well in advance of breeding

hand shears. This make it easy for newborn lambs to nurse.

Separate every ewe about to lamb from the rest of the flock, and make sure that she does not lamb outside in cold weather.

Just before or shortly after she lambs, put her in a dry, well-bedded lambing pen. Set the pen up in the warmest part of the shed or barn. See that there are

lambs get the ewe's first milk (colostrum).

Keep the ewe and lamb in the lambing pen for 12 to 24 hours. This allows a "mothering up" period and saves lambs that might be disowned or trampled.

After lambing, add grain gradually to the ewe's feed. By the time her lamb is 10 days or 2 weeks old, she should be getting a full ration of grain or concentrate along with hay.

### KEEPING SHEEP HEALTHY

Watch sheep for signs of disease. Some diseases can be helped by home treatment, but most of them need the attention of a veterinarian.

You can help prevent disease by—

- \* Starting with, and adding, only healthy sheep from healthy flocks.

- \* Housing sheep in clean, dry, well-ventilated quarters.
- \* Feeding properly and providing clean water.

- \* Sheep are attacked by many parasites. Prevention of these parasites is better than cure. Ask your local officer for information on parasites and on the diseases that parasites cause in sheep.

You can help control parasites by—

- \* Treating (drenching) at least once a year for internal worms.

- \* Keeping medicated salt available at all times.

- \* Dipping for lice, mange, mites, and other external parasites if necessary.
- \* Weaning early.

- \* Changing pasture whenever possible. Pasture rotation is important in parasite control.

### LAMB FOR YOUR TABLE

Generally a lamb can be slaughtered for home use any time after it reaches 100 pounds liveweight. Most ewe lambs are kept for the flock.

Continue on page 20

## LET'S RAISE A SMALL FLOCK OF SHEEP (2) by Herdsman

time so he can get used to his new home. Give him a little grain to get him in good condition.

When your flock is small and you only use one ram, you need a way of knowing when each ewe has been bred so you can figure out when she will lamb. Pigment smeared on the ram's brisket every day or two shows which ewes he has mounted.

Any commercial colouring (yellow, red, or ordinary lamp black) can be used. Mix the colour with castor, linseed, or old crankcase oil.

After 2 weeks change the pigment colour and watch.

### LAMBING

A good sheepman prepares for lambing time. Extra care at this time saves lambs and keeps ewes in good condition.

As lambing time nears, observe the ewes closely. At least 2 to 4 weeks before lambing, clip wool and tags around the udder and hind-quarters of the ewes with

no drafts.

A well-fed ewe seldom has trouble in lambing. However, if a ewe strains strongly and does not deliver within 30 minutes, get help from a person who has had experience delivering lambs. If such a person is not available, call a veterinarian. Make sure ahead of time that you can get help quickly if you need it.

Shortly after the lamb is born, dip its navel cord in a 4 percent solution of iodine. This helps prevent navel infections. Make sure that the lamb is dried promptly and does not chill.

Be sure that the ewe has "taken" to her lamb and that the lamb nurses within 30 minutes. Most lambs stand on their feet and nurse without help shortly after birth.

If the lamb is weak, help it to nurse. If the lamb is cold, get it warm as soon as you can.

After the lamb has gained a little strength, it usually gets up by itself. If it does not, repeat the feeding. It is especially important that

Continue from page 19

## SHEEP

100-pound lamb usually yields a 50-pound carcass and about 35 pounds of meat.

Lambs reach 100 pounds in 110 to 140 days. A lamb more than 1 year old does not put on enough weight to pay for its feed.

Extra feed can be made available to any healthy male lamb you want to slaughter, for home use. You can either see that he gets more concentrate on pasture, or you can confine him and give him extra concentrate.

The day before slaughter pen the lamb so he can be caught easily. Give him plenty of water, but withhold all feed for 24 hours before slaughtering. This marked dressing simpler.

Keep granular iodized salt before sheep and lambs throughout the year. If there is a shortage of certain minerals in your area, it may be desirable to use traced mineralized salt. Locate the salt box where it is protected from the weather, near the water supply, and in a shaded spot when possible.

Equal parts of ground limestone or steamed bone-meal can be mixed with the salt.

As an aid in controlling internal parasites, phenothiazine may be mixed with the salt. Your Vet. Officer or sheep supply store can give you information on amounts to mix.

See that fresh, clean water is available to the flock at all times. Pregnant ewes and nursing ewes require large amounts of water in winter if water is warmed.

Continue from page 16

## BREAD

It is to the credit of some Nigerian bakers that palm wine has been used occasion-

ally to cause quick fermentation. The correctness of this experiment needs approval however from a certified analyst.

How is a good bread made? Rich bread has a very stimulating aroma. Varied opinion says that sourdough once came into existence simply because someone in ancient times left a mixture of flour and water to stand for a while.

Later it was found that the baked from the dough became porous and had a delicious tartness. Besides possessing yeast spores, sourdough contains bacteria that produce lactic and acetic acid, which give the bread its agreeable tangy taste.

### CAN ANYONE MAKE A GOOD AND RICH BREAD?

Yes, that it possible, but it isn't always easy, to get a bread with a fine aroma. This is because there is an endless variety of sourdough bacteria, depending on the stiffness of the dough, its temperature and the time that the dough is allowed to stand, the aroma, develops in many different ways.

Therefore, making a really good sodourugh bread is recognised as one of the most difficult achievements of a baker.

"When a wife in ancient times succeeded in making a good sourdough bread, a bread the family members relished, she was wise enough to save a bit of the dough.

This was then mixed with enough flour to form a hard ball, and was used the next time she would bake. The ball was then dissolved in warm water. Of course, she was unaware of what happened to the doughball.

Now we know that the bacteria are awakened to life by the heat, and that they quickly multiply in the new

dough and secrete lactic and acetic acid until the whole dough is permeated.

### ADVANTAGES

"What advantages does sourdough bread have?", anyone may bother to ask.

The housewife of ancient times noticed that her family members thrived extremely well on sourdough bread. She couldn't explain why, but a modern nutritionist can. He says that sourdough bacteria build up protein of the same nutritional value as beef protein, and that the yeast spores and bacteria work together to widen the protein value of the bread.

But sourdough bacteria accomplish a very good work in another way. When the dough becomes more acid, the heat-sensitive vitamin B<sub>1</sub> is preserved much better, and that means that the bread will be richer in vitamins.

The ancient housewife had still, another advantage with her flour. She ground only the day's supply of flour, so that she always had newly ground flour when she baked. That was important for both taste and nourishment, since the quality of flour deteriorates through storage.

The outer shell of the kernel, the bran, was included in the flour. This is important, for the bran contains valuable mineral salts iron for the blood, phosphorous for the nerves and skeleton, and many other vital substances. A venturesome housewife can make good bread if she cares but.....

There are many fine recipes for sourdough bread. Very important in its preparation is the making of the sour. This may, for example, be made of 21 percent rye flour, 21 percent clear wheat flour, 33 percent cultured or plain buttermilk (milk with the highest possible acidity are best), 23 percent water, about

1 or 1½ percent each of milk powder and salt.

The milk powder and salt first are dissolved in the water, and then mixed with the buttermilk. Afterward the flour is mixed in by hand. This sour should be allowed to set for a day or two at room temperature.

Then use about one pound of this sour for every ten pounds of flour in the making of your bread, varying the proportion slightly depending on the degree of sourness desired.

There are, of course, many ways of preparing the sour. Unpasteurize milk soured at different temperatures and over varying lengths of time will produce different flavours in the finished bread.

Also cider vinegar, sauerkraut juice and souring liquid from pickle manufacture can be used in making the sour "

Why is it that commercial bakeries do not make such a sourdough bread today?

"Sourdough baking is a process that takes much time and requires know how in order to be good tasting. The baking must always be adjusted to the grain and to the daily weather. In foreign countries, a lot of sourdough bread is still baked, especially of rye.

But one must become accustomed to the new taste, and the stomach must become accustomed to the acids."

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TO  
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# ELECTRICITY BRINGS CHANGES TO FARMING METHODS (3)

by  
J. A. C. WEIR

*Agricultural and Horticultural  
Section, The Electricity  
Council, London.*

**T**HE MOST significant change which has taken place over the past few years in both cereals and hay-drying techniques had been the reduction in heat requirement to the point with some system where it is no longer required.

Where heat is still needed, the reduced requirement tends to favour the use of electricity as a heat source in preference to other fuels.

## DRYING CHOPPED HAY

The most recent development in crop-drying has been the adoption of the low-cost Dutch hay-drying technique for the drying of chopped hay. This is basically a system by which the stack of chopped hay, brought in from the field at a moisture content of between 30-40 percent., is radially ventilated from a central vertical duct with unheated air.

Although still at a development stage, it is hoped that chopped hay will be more suitable than bales for use in a fully mechanised system, showing a major reduction in labour requirements.

Increasing interest is being shown in the conditioning and storage of root-crop vegetables by ventilating the stored crop with warmed or cool ambient air. Onions can be successfully ripened, in a bulk store, by ventilating with warmed air at a high humidity, thus avoiding the spoilage so often experienced with field ripening. Cured onions, carrots and potatoes can be stored, in bulk, well into the Spring by selective ventilation, using cool ambient air.

Such selective ventilation can be effected automatically

In this final instalment, modern applications of the power of electricity are discussed.

by means of thermostat control which allows ventilation to take place only when the temperature of the ambient air is lower than that of the stored crop.

A relatively new development in crop conservation has been in the techniques of chilled-air conditioning. By conditioning moist grain with chilled air so as to reduce its temperature within the range of 4-10 degrees Centigrade (39.2-50 degrees Fahrenheit) and maintaining it at this level, the grain can be stored in bulk, without deterioration, for several months.

This technique has been quickly and successfully adopted by farmers and special chilling units for this purpose are now on the market.

Chilled-air conditioning as a means of conservation has certainly not been confined to cereal crops as trials now suggest standard shilling units could also be used for conditioning vegetable crops such as carrots and potatoes for long-term storage, and crops such as celery, lettuce and soft fruits for short-term storage.

## FUTURE CHALLENGE FOR ELECTRICITY

Although electricity is already having a considerable impact on agriculture and horticulture, this can still

only be regarded as a beginning.

By the turn of this century we shall not only have seen the last of livestock in the field but fundamental changes will have taken place in arable and forage cropping, glasshouses, as we know them now, may well have all but disappeared. Livestock and horticultural holdings will, more than likely, consist of groups of specialist controlled environment, windowless buildings with little or no adjoining land.

Manual supervision in all production units will have been effectively minimised by the use of programmed, automated mechanical processes with secondary monitoring systems controlled from a central point by means of closed-circuit television scanning devices.

Certain arable and forage crops will no longer be traditionally produced in the field; they too will be subjected to production-line growing within a controlled environment.

Most significant of all, the computer will then have become as much a part of the farming scene as the combine harvester is today.

*YOU MAY NOT  
HAVE NOTICED  
THIS, IN OUR LAST  
ISSUE UNDER NEW  
EQUIPMENT:-*

## RUSSIAN PORTABLE ELECTRIC STATION

**KIRGHIZIAN** shepherds have received an excellent present. Engineers of a branch of the Frunze Electro-mechanical Research Institute constructed a tiny power station.

It weighs a little over 20 kilograms and can be carried in an ordinary suitcase. All that is needed to put it into operation is a mountain rivulet or even a brook.

Water, supplied with the aid of a flexible nylon pipe, revolves the miniature turbine. The energy thus produced is sufficient for lighting the shepherds' house and the sheep-yard pens.

Several hundreds of these popular micro-hydropower stations had been purchased by collective and state farms recently.

*For further particulars on landing cost in Nigeria please contact: The Commercial Attache, Embassy of U. S. S. R; 28 Kofu Abayomi Road, P. O. Box 3229; Lagos.*

# LAUGH !!!

"Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

AT the end of a long journey, three friends arrived in a hotel feeling beastly hungry and ordered for lunch. The waiter understood and hurriedly returned with three large akara balls while the main menu was being prepared. Two of them were about to pounce on their share of the akara balls when the other piously said, "Brethren, let us pray."

They immediately closed their eyes, but one of them grew suspicious and merely covered his face with his hands and was watching. The chap who offered to pray then said slowly and reverently "Thanks be to father," and as he said this, he took one of the balls and ate it. Then he said "and to the Son" and took another akara and ate. As he opened his mouth to say anything else, the man who was watching said furiously "if you touch the Holy Ghost, I'll stab you."

A teacher was trying to give her class of minors an idea of population of China. She told them that for every two persons in the world, one was a Chinese. She went further to bring home the idea. Said, she "every time you breathe in and breathe out, a

Chinaman dies" A five-year-old named Sankey sitting in a corner of the class became thoughtful and then suddenly started breathing in and out rather vigorously. The teacher turned to him and asked, "Sankey what are you doing?" "Killing Chinamen," replied Sankey panting for breath.

A conductor in a Lagos bus was reproofing a passenger sternly for smoking in his crowded public transport. "I expect you can read and understand", said the conductor in the bus, "don't you see that notice which clearly states '9 standing, no smoking?'" "But I am sitting," replied the passenger, "the notice is intended for 9 passengers standing."

TWO school boys were on pedestrian side of Carter bridge watching fishermen making their catches. Then Olu remembered an arithmetic problem and put it to his friend, "Akin" he said "A herring and a half cost three half pence what is the cost of 12?"

Akin looked up and then down, took out a piece of chalk from his pocket and was trying

to work out the answer until all the available space on the bridge where they stood was covered with figures. Then he looked up suddenly and, asked "Olu what is the problem again?" Olu said "A herring and....." "My goodness!" exclaimed Akin "No wonder I cannot get at the answer, I was reckoning with 1 b r u fish instead of herrings."

A parson was reproaching a member of his congregation for being habitually drunk. He said "Kente, you know that drink is your enemy why don't you try to avoid it?" "But, parson!" replied Kente, "you have told us often enough that we should love our enemies," "Oh yes, Kente!" said the parson, "love your enemies indeed, but do not swallow them."

A man in a booze managed to get to the door of his flat and for some time was fumbling with his key. It soon became obvious to the passers-by that he was having difficulty in opening the door.

One of them came to him and asked if he could be of help. "Yeah guy!" he said, "just hold the door to keep

it steady, while I put the key into the key-hole."

X X X

Continue from page 9

## PLANNING A LAYING UNIT (1)

The biggest disadvantage of the plan is that the rearing houses stand idle for much of the year, from Christmas until the early rainy season, and during that time they are earning no money. Bigger profits per bird are necessary to compensate for this disadvantage.

Next month: Planning a Laying Unit Part 2

### CLASSIFIED

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# FARMSTOCK

STOCKBREEDERS' & FARMERS' MONTHLY  
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● HORTICULTURE ● FARMING & ● FOODSTUFFS ETC.

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**AUTOMATIC EGG GRADING & PACKING MACHINERY**

PAGE 4

**FEB. '69**  
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Feb. '69  
Vol. No. 9  
Price: Sixpence

# FARMSTOCK

P. O. BOX 79, EBUTE META NIGERIA.

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## New Equipment

### AUTOMATIC EGG GRADING AND PACKING MACHINE

BRITISH FIRM—BEN NEVIS EGG EQUIPMENT LTD., TROWBRIDGE, WILTSHIRE, ENGLAND—HAS LAUNCHED A NEW AUTOMATIC EGG GRADING AND PACKING MACHINE.

Girls can operate the automatic, high Capacity, loading, candling, grading and packing unit—capable of handling 10,800 eggs an hour.

The eggs, 15 at a time, are passed on a three-track conveyor into a candling unit, where powerful lights and mirror reflection help in the detection of all types of egg fault.

From this stage the eggs move on and are sorted, by weight, into their correct

grade. Final stage embraces the stamping of the eggs, which are aligned and collected into rows in the packing head. Here sets of nylon fingers receive and gently place the eggs into automatically conveyed cartons.

The machine is ready for export. The manufacturers will entertain enquiries from overseas.

Please mention FARMSTOCK Magazine as your source of information.

x x x x x x x x

### NEW BRITISH TECHNIQUE IN SEED PLANTING

A MACHINE just produced could prove a great boon to farmers throughout the world. Called the 3-D Drill, it is claimed by the British makers to be the first commercial machine designed for drilling seed direct into uncultivated soil. The 3-D Drill featured at the Royal Smithfield Show at Earls Court, London, recently.

Though primarily designed for sowing cereals and kale, the 3-D Drill has also been successful with other crops such as beans and rape. It will also operate on conventional seedbeds or following minimal cultivation.

Its triple-disc couler is a special feature, capable of penetrating hard, dry soils and of cutting through heavy trash and deposit seed at a uniform depth with minimum soil disturbance. The small-diameter front disc cuts a narrow slot in the soil, and the larger inclined pair of discs expand this to receive seed and fertilizer.

Normally the front disc is set  $\frac{1}{4}$ -inch lower than the rear discs; but this can be reversed to limit penetration in soft soils or in a cultivated seed bed by raising the drawbar hitch or adjusting the position of the front discs.

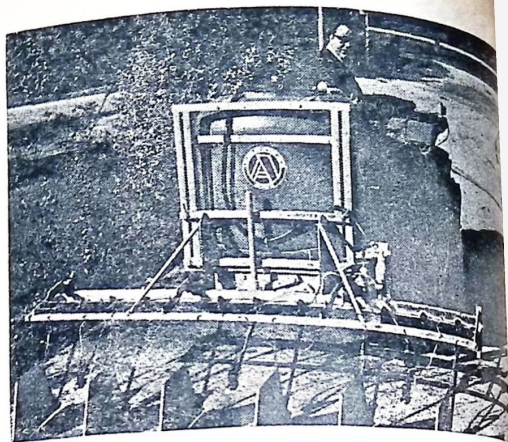
The 15 coulters adjustable are normally set at 7-inch spacing. They are actuated through their springs by a single-acting hydraulic ram operating from the tractor but for overseas use the springs may be replaced by a double-acting ram to allow the use of lower pressure hydraulic systems.

The hopper feeding the 15 rows has a capacity of 35 cu. feet. (or about 18 cwt.), and the ratio of seed to fertiliser can be changed by an adjustable partition.

Capable of working at a speed of 8 m.p.h., the 3-D Drill requires a tractor of 65 horse-power or more.

(Designers: Plant Protection Limited, ICI House, Millbank, London.)

Makers: John Darbyshire and Co. Limited, Sumercotes, Derbyshire.)



## New Attachment

### Converts

### Conventional

### Sprayer For

### Inter-Row Spraying

This new Sprayro attachment—shown here working on concrete to demonstrate the accuracy of application—has been developed by a British Company to convert conventional crop sprayers to low pressure inter-row units.

The Sprayro is an 8-foot (about 2.4 m.) wide toolframe that carries three Plant Protection Vibrajets and six crop protection shields, hinged to follow ground contours. Conversion is simple :

the conventional boom is removed, the attachment put in its place and connected to the plastic spray tank.

The machine is designed for the application of chemicals for inter-row weed control in such row crops as grass seed, brassicas, dwarf beans and strawberries.

The Sprayro can also be supplied with four Vibrajets—or as a complete unit with tractor-mounted tank, pump, and full instrumentation. It was exhibited at the 1968 Royal Smithfield Show held at Earls Court, London, recently.

# WORLD-WIDE ATTRACTION OF THE POULTRY SHOW

*The International Poultry Show, held at Olympia, London, last December broke at least two records: it was the biggest ever, and it attracted more overseas visitors than ever before.*

**M**ORE overseas visitors than ever attended the last International Poultry Show, held at Olympia, London, early in last December. They were admitted free and had their own lounge. The show was the largest since its foundation in 1945.

It had been transferred from the National Hall to the much larger Grand Hall and Gallery, which meant that everyone on the waiting list could be accommodated. More than 130 trade exhibitors occupied 87,540 square feet (8,133 square metres) of floor space.

Among them were leading enterprises from Belgium, Denmark, France, Germany, Italy, the Netherlands and the United States of America.

Among more than 100 additional prizes on offer were those from the National Association of Poultry Packers and the British Turkey Federation. There are, of course, the International Poultry Show championship trophies

themselves, and the coveted Ludovici prizes from the Poultry Club of Great Britain.

## THOUSAND OF BIRDS A DAY

British representation was wide. The range of housing, equipment and ancillary trades included everything from a chick wing-band to a table poultry processing machinery, capable of handling tens of thousands of birds a day.

On the housing side, controlled environment and mechanisation predominated. Manufacturers brought forward their latest completely automated rearing and laying cages which reduced labour requirements.

Those rearing cages included units easily convertible to accommodate stocks from the day-old stage right through to the end of their period of lay. The more orthodox laying cages were in flat-deck, California-type and two-, three- and four-tier upright. Most were fully mechanised and more than one were equipped with automatic egg collecting machinery.

The world poultry industry has come a long way since incubators were measured in 1,000-egg capacity. Today the hatchery-man talks in tens of thousands and uses machines into which he wheels trolleys fully laden, tier upon tier, with hatching eggs.

Several types of these "walk-in" machines were on view at Olympia; so were the smaller machines suited to the specialised hatchery-man. There were brooding equipment in a wide variety, deriving heat from many sources.

BY

GEORGE MAY

"OF 'POULTRY WORLD'"

LONDON

the hybrid, and many others whose names were once famous in the poultry show ring.

They probably, were not in the public eye as much as at the turn of the century, but as a spectacle, they still appealed to poultry-keepers of all classes and were always a popular feature at the show.

This section had the backing of several specialist breeds societies.

Bantams, as usual in show circles nowadays outnumbered large fowls by two to one; at Olympia they were virtually a show in themselves.

Nearly 900 signatures of overseas visitors from more than 50 countries appear in the records of the 1966 International show (the 1967 event was cancelled because of foot-and-mouth disease). That number was likely to be well exceeded.

Neither had to look far for packaging material suited to his individual needs.

Behind the equipment and housing manufacturers will be the suppliers of feed-stuffs, veterinary, hygienic and medicinal requirements. Stock in-terests were covered by the many breeders at the show.

## BIGGEST DEADSTOCK SHOW

The favourite of all show-goers was the competitive live and deadstock sections. The deadstock classes were claimed to be the largest at any show in the world. They included freshly-killed and oven-ready chickens in the popular market weights and a huge display of turkeys.

Classes were for single birds, pairs and market packs, all competing for trophies.

The livestock included all those pure breeds, which ruled the roost before the advent of

---

## READ

## Farmstock

## ALWAYS

- Live Chickens
- Oven - Ready
- Eggs (all sizes)

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Lagos

# LETTERS FREE MILK IN SCHOOLS PLEASE

series, one easily gathers how helpful to the body milk is.

Since not every child can win a scholarship, but every child is needed as a citizen one day, is it not more

beneficial socially to give every child free milk daily? The Education Department should bear the cost.

Sir,  
YOUR series on Milk is very educative. From the

Offa

LERE SALISU.

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# Bata

THE SIGN OF  
GOOD SHOES



FREE MILK IN SCHOOLS  
PLEASE

UNPRODUCTIVITY IN  
LUX AT AGEGE

Sir,  
METHINKS time was  
to stop the UNPR  
DUCTIVITY in grand  
at the Government  
Agege.

Nigeria cannot afford  
be wasting fortunes on unpro  
ductivity as at Agege.

I am suggesting the follow  
ing measures: a close-st  
of the place, turn the wh  
of our Agricultural Dep  
ment into a self-support  
Corporation or hand it  
to progressive farmers to  
Ilaro

X X X

FARMSTOCK GOES  
BREADWISE

Sir,  
NE cannot help prair  
the expertise with  
your article on BREAD  
been written.

This is the first time  
paper delves into our  
problem. As you have  
breadwise, please find  
for other foodstuffs to  
us-apish as we are-to  
least a warning against  
unbridled copy-craze.

Ilorin YAKUB LA

ARE THERE VET  
OFFICERS?

Sir,  
SUCH ink has been sp  
wasted by many who  
been writing to ask for  
whereabouts of Vet Off  
in this country.

Your paper continues  
advise one to contact  
nearest Veterinary Officer  
this or that complaint:  
truly no one has been  
any of such people.

Personally, I want  
Farmstock to find out  
the benefit of all if the  
Military Government has  
Veterinary Department  
If such a department  
where are those being  
for what there please?

EBUN KO

Yaba-Surulere

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**EGG**

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SUPPLIERS OF PEDIGREES TO MINISTRY OF AGRICULTURE.

RESULTS AT OPTIMAL CONDITIONS

About 246 eggs in 330 laying days, white or brown shell. Average weight of Egg 2.22oz. Average weight of laying hens at 40 days 6.8 lbs. Average weight of broilers at 9 weeks 4.1 lbs. at 10 weeks 4.7 lbs

# PLANNING A LAYING

## UNIT (2)

**L**AST MONTH'S article discussed planning a laying unit to meet the expected needs of customers for eggs. There are two other important questions to ask oneself when planning the unit apart from "How much can I sell?" These are "How much money should I invest?", and "How big a unit can I manage?"

"These questions are important because although customer demands fix the maximum size of the unit, it is not always in the best interests of the farmer to try to produce as much as he could sell.

1. It may be possible to buy eggs at some times of year more cheaply than he can produce them. Or his money may be more profitably invested by trading in eggs.

How much money is needed for egg production? There are three main aspects needing money.

1. Land and services.
2. Buildings and equipment.
3. Birds.

Little need be said here about land and services, but

by

**L. J. Elmslie M. A. (Cantab)**

*Specialising in Agriculture*

*Technical Director, Ejinaka & Thornber Ltd.*

2. He may have some other business in which his money would earn more profit.

3. He may be short of money. It is useless to try to keep more hens than one can feed.

4. There may not be too much room in the poultry farm. Crowding birds on one site can bring disease problems.

5. The people who are looking after the birds may not be too experienced.

It is better to learn on a few birds rather than many.

All these factors should be considered in planning how many layers to keep and making the farm plan.

they are costly for many farmers. As well as the cost of land there is the cost of any roads, fences and water supplies that may be needed. All should be considered in planning.

Buildings and equipment are the easiest items to cost. The money to be spent can be calculated quite easily once the system to be used has been chosen. The costs and advantages of various systems will be considered in a later article in this series.

Let us only say here that the housing cost for a laying bird should not exceed £1 and that for a grower should not exceed 15/.

The cost of rearing birds up to the time they come into lay is an important part of the farmers' capital. As well as the cost of the day old chick

there is food, labour, medication, litter and other costs which all mount up as the birds get older.

The total money spent on each layer before it is laid is enough to meet current expenses will be about 17/-. It is very important that the farmer should have that money available at the right time, which takes planning.

Continued on page 19

## TRAPPING WITH HUMANE

### HAVAHAART TRAPS

#### THE WORLD'S FINEST TRAP FOR FARM, HOME AND INDUSTRIES

*You can catch anything from a mouse to a fox, alive and unhurt.*

*With these traps it is now possible for the farmer or suburbanite to eliminate pests from his property without harming pets or valuable animals.*

*An animal may be molesting the poultry, may be destroying food in the provision stores, in the house or kitchen, in the farm, in the granaries etc; some would prefer to use poison, the steel trap, or the killer type for taking animals, the average problem occurs where there are the other valuable animals, or little children around, which may fall victims, one or more HAVAHAART TRAP is the answer. Join the thousands who agree that the HAVAHAART TRAP is the most unique animal trap in the market today. Poultrymen, farmers, estate woners are using these traps successfully for years.*

*An outstanding advantage of Havahart traps is that they capture without injury whatever they catch, (it may be your neighbours cat) the animal can simply be transported to a place where they can do no harm, and you do not have to kill them unless this is desirable.*

*With these traps you can rid your property of pests without harming children, pets or valuable animal. NO SPRING TO BREAK OR GET OUT OF ORDER, entirely galvanised, rust resistant, can't harm pets or children, completely humane, simple to operate, lasts a lifetime. Portable.*

*HAVAHAART TRAPS are made in standard sizes to suit individual type of animal.*

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54, Nnamdi Azikiwe (Old Victoria) Street,  
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LAGOS.

# NEWS

## FARMING BRIEFS

### SULTAN OF SOKOTO EXCELS IN AGRICULTURE

THE Sultan of Sokoto has been commended for presenting the best cotton fibre at the last Agricultural Show held in his Emirate.

The Emir received a tray of "Three Rings." He later enjoined all farmers to make use of modern equipment to help them in mass production of their crops.

### FARMERS ASSURED

THE farmers of Southern Eastern State have ended a conference. One of the speakers Mr. S. Udo-Inyang, Commissioner for Finance and Economic Planning, assured the farmers of the support, morally and financially, of the State Government

### PROGRESS AT BORNU ROACH

Substantial and encouraging results have been reported in the Bornu Cattle and Breeding Ranch at Gombole about 21 miles after Moidu, GUU

This project is assisted by the U. S. A. I. D. and covers 20,000 acres. It is hoped that when the project starts full operation about 400 animals will be available for distribution as main stock to other farmers annually.

### CROP FORECASTING

THAT crop forecasting will enable the Nigerian produce Marketing Company Limited to plan successfully the sale of produce has been stressed by Mr. M. A. Akintomide, Permanent Secretary, Western State Ministry of Agriculture & Natural Resources.

The remark was made at the sessions in the to week sec m Ministry of a officers of in ar for senior,

## 4 MILLION POUNDS TO BOOST AGRICULTURE

A sum of £4 million pounds has been set aside by the Federal Military Government for improving agriculture generally throughout the Federal.

The Federal Commissioner for Agriculture and Natural Resources, Alhaji Yahaya Gusau made this disclosure recently at Kaduna the capital of the North Central State where he was on a tour.

The Commissioner disclosed that part of the money would be available as loan to farmers while heavy agricultural equipment to mechanize mass production of food for the Republic would also absorb some of the money.

In view of this mammoth scheme, all the State Commissioners of Agriculture are conferring regularly to discuss their peculiar needs under the overall interest of the Republic.

### U. S. SCIENTISTS FIND NEW SOURCES OF FOOD

U. S. Scientists are perfecting a new food product obtained by the combination of soybean and banana. The combination is dried and ground to powder. The product is a good food for babies.

It has been established that the soybeans helps in absorbing some of the water content of banana which in itself is a good carrier of protein - the main food in soybean.

✦ American agronomists are also improving on a process of producing good

GARI (Nigerian's most popular food stuff) from potato.

### FARMING SCHEME FOR YOUTH

Youths who have graduated from the Free Primary Education Scheme are to benefit from a big and attractive Farming Scheme by the Western State

The first hint of the project was given recently by Mr. B. O. E. Amon-Acting Controller of Agricultural services in the Western State Ministry of Agriculture.

The aim is to stem the steady exodus from farmsteads for other occupations in towns. Comparative analysis of incomes from farm occupations and other jobs has been made to assure the beneficiaries of what better chances they would have on the farm.

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### NAMING

### CEREMONIES,

### TO PROGRESS

### YOUR

## FARM

PRODUCT

INFORMATION

# TYLAN

**T**HE product TYLAN containing the antibiotic Tylosin Tartrate has proved to be very effective for the control, treatment and prevention of Chronic Respiratory Disease (CRD) and Pleuro-pneumonia-like organisms (PPO) in chickens and is equally effective against infectious sinusitis in turkeys.

The product is available in two forms—the injectable form and the soluble form.

*Tylan Injectable*

This is the injectable form. At the first signs of CRD in chickens it is recommended that TYLAN be injected subcutaneously just back of the head at the rate of 25 mg per kg of body weight. All chickens in the infected flock should be treated, whether they show symptoms or not.

Since some irritation occurs at the sight of injection, intramuscular administration should be avoided, particularly in broilers. If no improvement of the chickens is noted in five days the diagnosis should be reconfirmed.

**TYLAN SOLUBLE**

The soluble form is added to the drinking water for chickens at the rate of 0.5 gm per litre at the first signs of CRD in them. This should be continued for a period of one to five days, depending on the severity of the condition. The TYLAN medicated water should be offered as the only source of liquid.

A fresh solution should be prepared every three days. If no improvement of the chickens is noted within five days after the cessation of treatment, the diagnosis should be reconfirmed.

**(1) TYLAN Injectable**

Only sterile water should

be added to the bottle to reconstitute the Tylosin for use. All care should be taken that contamination of the contents does not occur at the time of adding the diluent or during the time of injecting the chickens. After reconstitution, TYLAN Injectable should be administered within 24 hours.

All equipment used for injection of Tylosin should be sterile and chemically clean. Swab the injection area with disinfectant before the injection. Use preferably an 18 or 20 gauge, 12 mm needle and inject the Tylosin solution under the loose skin of the neck immediately behind the head.

Avoid intramuscular injection. **CHICKENS SHOULD NOT BE SLAUGHTERED FOR MEAT WITHIN 72 HOURS AFTER TREATMENT WITH TYLAN INJECTABLE TO ALLOW ALL TRACES OF THE ANTI-BIOTIC TO BE ELIMINATED FROM THE TISSUES.**

**(2) TYLAN Soluble**

A fresh solution of Tylan Soluble should be prepared after three days. To ensure adequate drug intake, no liquid should be accessible to the chickens other than the TYLAN medicated water.

**CHICKENS TREATED WITH TYLAN SOLUBLE IN THE DRINKING WATER SHOULD NOT**

**BE SLAUGHTERED FOR HUMAN CONSUMPTION WITHIN 24 HOURS AFTER CESSATION OF TREATMENT TO ALLOW ALL TRACES OF THE ANTI-BIOTIC TO BE ELIMINATED FROM THE TISSUES.**

**Storage**

Both TYLAN Injectable and TYLAN Soluble are very stable in the dry form and need no special conditions other than cool, dry storage. Excessive heating should be avoided.

**Caution**

*Do not use TYLAN Soluble or TYLAN Injectable in Layers producing eggs for human consumption.*

*Distributors are :*

*Abdul and Company Limited, Private Mail Bag 1077, Yaba.*

*Telephone : 44144.*

*32b, Herbert Macaulay St. Yaba.*

SHORT ARTICLES

ON ANY KIND

OF DRUGS, FOR

LIVESTOCK

POULTRY

FARMING CROPS TREES ETC.

HORTICULTURE

Are accepted free on this page

# FARM POULTRY MANAGEMENT (1)

**F**ARM poultry flocks are kept principally for egg production. If farm flocks are obtained from bred-to-lay stock and are properly managed, they can maintain a high rate of production throughout the year.

*Speciality meat-type birds—capons and roasters—are particularly suited to farm production. Broilers usually cannot be grown on the farm as economically as they can be grown commercially.*

## PROFITABLE POULTRY MANAGEMENT

A farm flock can be profitable if the poultryman—

- \* Maintains a large enough flock so that he uses labour economically.
- \* Produces a high-quality product—market eggs, hatching eggs, or speciality meats.

Starts with high-quality birds.

- \* Uses good feeds.
- \* Keeps the poultry house clean and dry.
- \* Employs sound management practices.
- \* Employs sound marketing practices.

### SIZE

The trend is toward larger farm poultry units. There are many small flocks, however, that contribute to farm income.

The exact size of the poultry flock that is economically feasible is influenced by other farm enterprises, as well as by the geographical location and distance to markets. Guides to minimum flock sizes for efficient farm poultry production are listed below.

A laying unit should have a minimum of 1,000 birds.

*Mr. S. Kojo Plange is a big poultry breeder in Ghana. He is shown here tending a flock of chicks.*



A breeding (hatching egg) flock should have at least 1,000 pullets or hens; a capon or roaster flock, 2,000 birds; and a broiler flock, 5,000 birds.

Larger flocks usually are more economical.

### HATCHING VERSUS MARKET EGGS

Market eggs may be sold to whole-sale or retail outlets. Fertile hatching eggs usually are sold directly to hatcheries.

Most farm breeding flocks produce hatching eggs under contract with a hatchery. The hatchery may specify the strain or cross of the breeding flock. It may provide pullet or cockerel chicks or both to be used as breeders.

Hatching eggs cost more to produce than market eggs. The added expenses include the costs of:—

- \* Raising and keeping cockerels.
- \* Providing special (breeder) feeds.

are scientifically bred to produce meat efficiently. Commercial production is on a year-round basis; less than 1/2 percent of our Nation's total poultry meat production comes from farm flocks as a by-product of egg production.

Continue on page 19

- \* Blood-testing birds for pullorum disease and fowl typhoid.
- \* Increased feed consumption, particularly of broiler parent stock.

To justify these costs of production, hatching eggs must sell at a premium over market eggs.

### MEAT PRODUCTION

Before undertaking the production of meat chickens, a poultry man should determine how and where his birds will be marketed.

Broilers (young chickens for frying, broiling, or roasting) once were largely a byproduct of egg production.

Today's commercial broilers

# Q

for

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By Sam W. Morris  
U. S. Feature Writer

# TREE FARMS

STATES MORE THAN  
AGO THERE WERE  
NATION'S TIMBER-  
GRAVE DANGER OF  
BECAUSE OF HEAVY  
CUTTINGS AND FOREST

inspect their woodlands and  
render them other assistance.  
Many tree farmers open their  
forest lands to people for  
recreational uses such as  
fishing, camping, hiking  
and hunting.

## MANAGEMENT

The certified tree farmer  
is one who knows how to  
manage his forest success-  
fully, to protect it adequa-  
tely from fire, insects, diseases  
and destructive grazing. He  
is constantly alert against  
harmful insects and diseases,  
the greatest enemies of  
timber and the most difficult  
to control.

The tree farmer removes  
decayed, deformed and dis-  
eased timber to keep his  
woods healthy. He uses  
improved planting, seeding  
and fertilization. He pro-  
duces more selective, vigo-  
rous and desirable species of  
trees.

He thins his over-  
crowded stand of trees to give  
the remaining trees more  
room to grow and more sun-  
light to absorb. When he  
harvests, he either leaves  
trees for the next cutting,  
or promptly reforests the  
areas by direct seeding or  
by planting the harvested  
acres with seedlings.

Depending on variables  
such as climate, region, tim-  
ber site and markets in the  
area, a tree farm can earn  
for its owner a return of  
three to six percent per  
hectare per year. One large  
diameter mature walnut tree,  
for example, can bring as  
much as £6000. An average  
size walnut tree can net  
the grower £500 or more.  
Tree farming, of course is  
no get-rich-quick scheme.



Logs floating in the Lagos Lagoon ready for the sawyer's pit. These logs are just cut from thick bush without replacement.

but incomes are helping  
owners to pay off mortgages,  
finance the college education  
of their children, build new  
homes, or by additional  
land for agricultural use.  
"said J. C. McClelland chief  
forester of the Amer can  
Forest Institute.

Aside from their inter-  
est in income, tree farmers know  
they are managing a valu-  
able resource that is con-  
tributing importantly to the  
nation's wood supply needs.

## VALUABLE CONTRIBUTION

Not only are trees being  
grown for the making of  
thousands of wood pro-  
ducts, but tree farms are  
helping to meet the public's  
demands for outdoor recre-  
ation

"Populated areas are  
getting cleaner more plenti-  
ful water from forest lands.

"Forested areas are sta-  
bilizing the soil and saving  
it from erosion.

"Wildlife is better able to  
survive and multiply in the  
shelter of managed forests.

"Cattle and sheep in pine  
forests are yielding more  
meat They are fenced out  
of hardwood stands.

"Woodlands are beauti-  
fying the rural landscape  
for people to enjoy.

As long as wood is a re-  
newable natural resource, and  
trees can be planted and  
grown as an agricultural  
crop, sawmills, pulp mills,  
plywood mills and wood  
products factories can expect  
a bountiful yield of wood  
to meet their needs in the  
next few decades, most for-  
esters believe. The only  
question is how much forest  
land will be lost to other  
uses.

## UTILITY

More than 5,000 consumer  
items of everyday use are

made of wood. The de-  
mand for them will grow as  
the population increases, and  
the need for more wood  
will simultaneously become  
greater.

It has been estimated that  
the consumption of plywood  
and pulpwood in the next  
20 years will double today's  
demand.

Besides providing lumber  
for construction work, trees  
are sources of products such  
as furniture parts, papers  
for books, magazines and  
newspapers, packaging and  
shipping containers, abrasive-  
resin additives, rayon, cello-  
phane, photographic film,  
plastics, lacquers, and many  
other chemical products.

There seems to be an en-  
dless number of products that

Continue on page 20

# THE FLY PROBLEM (2) AND ITS CONTROL

by Our Sanitary Correspondent

**I**N the preceding issue which was the first of these series the menace and life cycle of a fly was discussed.

In this issue, the life span, the habitat and species of flies are discussed. Read on please :

*A popular misconception is that small flies grow up to be big flies. It is not true. They only represent undernourished individuals or a different kind of fly altogether.*

There are four different stages in the fly. The eggs are deposited in moist organic matter. Each female can deposit from a few hundreds to 2,000 eggs during her lifetime. The eggs hatch into tiny larvae or maggots which feed on the organic material.

The maggots grow rapidly and then turn into inactive forms called pupae. These pupae then change into adult flies which start the cycle all over again. This life cycle may take from a week to several months depending upon the kind of fly, the time of year, the temperature, humidity, and available food.

### Where do flies come from ?

If you live in town—flies may be hatching right in your own backyard. Almost any moist organic material can produce flies. Check to see if you have any of these fly-breeding places :

- \* Garbage cans with holes or improperly fitting lids.
- \* Moist bedding straw.
- \* Dead chickens and animals.
- \* Manure and offal.
- \* Waste organic material in drain ditches.

Flies from open garbage dumps, fruit or vegetable waste disposal sites, manure stock piles, or dairies may be effectively controlled through proper management practices.

Fly problems involving such sources may require co-operative action by public health and agricultural agencies, city or state authorities, industries, local residents, and farmers before a satisfactory solution can be reached.

### o you know that ?

- \* There are approximately 85,000 different kinds of flies in the world.
- \* There are several thousand different kinds of flies in Nigeria.
- \* There are several hundred kinds in any one Nigerian locality.
- \* Only about 20 different flies are of public health importance in our country.
- \* Urine or blood-soaked soil.
- \* Unharvested or discarded fruits or vegetables.
- \* Walnut hulls and fruit pits.

6. Greenbottle Flies (Phaenicia spp.)
7. Bluebottle Flies (Calliphora spp.)
8. Black Blow Fly (Phormia regina).
9. Flesh Flies (Sarcophaga spp.).
10. Vinegar Flies (Drosophila spp.)

House flies are able to travel as much as 20 miles and frequently do fly up to 4 miles from their point of origin. Other kinds of flies can and do travel distances as great as 30 to 50 miles.

### What can you do about Flies ?

Fly control depends on stopping the flies before they get started. This can be done by making it impossible for them to develop. As larvae require warm, moist organic material to survive, the answer lies in proper handling and disposal of these materials.

In the next and final installment, the prevention of fly breeding, control of larvae pupae and adults will be discussed to end up with the use of insecticides.



Of these, the ten most important kinds are :-

1. House Fly (Musca domestica)
2. Lesser House Fly (Fannia canicularis).
3. Stable Fly (Stomoxys calcitrans).
4. Black Garbage Fly (Ophyra aenescens)
5. False Stable Fly (Muscina stabulans).

FIGHT  
FLIES  
WITH  
INSECTICIDES

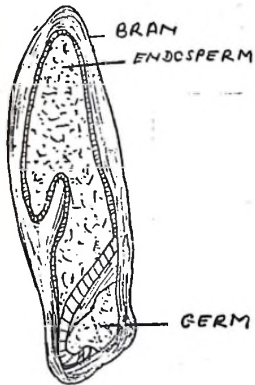
# WHAT IS BREAD (2)

(The diagram is a representation of the composition of a loaf).

**BREAD AS PART OF A MEAL SHOULD NOT ONLY BE NUTRITIOUS BUT ENJOYED AS WELL: TO THIS EXTENT BREAD CAN BE PREPARED IN VARIOUS WAYS AND SHAPES TO SUIT DEFFERENT PALATES AND PLEASING TO THE EYE AS WELL.**

*Some enjoy the crusty part of bread and others the white of bread, hence the popular French roll which is crusty and crunchy and the ordinary white bread which has plenty of white i.e., the inside of the bread.*

As flour is the foundation of pastry also of bread and cake, some knowledge of its constituents and their properties is useful, as these determine not only the relative food value, but also the suitability for special purposes in cookery of grain of wheat under the microscope shows the following parts—the "germ" which is rich in gluten, the flesh joining protein and fat.



In wholemeal flour the three parts of the flour have been retained, while in white flour the bran and certain portions of the germ are eliminated thus lessening the nutritive value considerably. Thus we have three chief classes of flour, i.e., the ordinary household and patents, wholemeal and fine pastry flours such as Vienna or Hungarian, the last two types are richer in

starch but poorer in gluten and are more suitable for fancy breads than the first type.

As a result of the present condition of living, the baking of bread has ceased to be an essential duty of the house wife. But "white bread" being about the only variety of bread common in this country, readers may be interested to know more about the other varieties and the type of flour used in making them.

In the process of making bread, a raising agent is added such as yeast (a popular agent) and other raising agents like:—

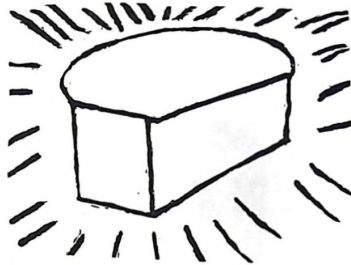
1. Baking powder.
2. Cream of tartar.
3. Butter milk or sour milk with bicarbonate of soda.
4. Vinegar or lemon juice and bicarbonate of soda and
5. Palm wine (a recent addition over the last

An analysis of BREAD by Our Dietician

century).

Bicarbonate of ammonia is used commercially, but is apt to impart an unpleasant flavour. Whichever raising agent is decided upon for used, a process of fermentation takes place whereby carbon dioxide and alcohol are produced causing the dough (the mixture of flour before being put into the oven) to swell.

Three main types of flour have been discussed, whole meal, white and Vienna or

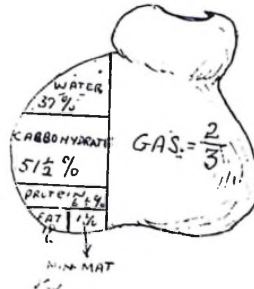


Hungarian flour. Some types of bread made from them are illustrated in the following recipes.

## BROWN BREAD (WHOLE MEAL FLOUR)

### A. Proportions

- 14 oz: whole meal flour.
- 14 oz wheaten flour.
- 1½ Teaspoon salt.
- ½ teaspoon castor sugar.
- ½ pint tepid water or milk and water.



## METHOD

Fine, coarse of medium wholemeal may be used, a lighter loaf is made with half wheaten and half wholemeal flour, and the bread may be made by setting a sponge or by the following method without a sponge.

1. Sieve flour and salt into a warm basin, add the whole meal: cream the yeast and sugar, add the tepid liquid, strain this into the flour.
2. Mix and knead thoroughly until smooth.
3. Set to rise for 1 hour, then knead slightly on a floured board.
4. Form into two loaves and put into warm floured tins, "prove" in a warm place for 15 minutes.
5. Bake in a hot oven for about 45 minutes.

## Unfermented or Baking Powder Bread

### B. Proportions

½ lb flour

½ Teaspoon salt of milk or water.

1 large teaspoonful of baking powder.

### Method

1. Sieve flour, salt and baking powder together.
2. Add sufficient liquid to eat to a soft dough.
3. Handle as quickly as possible, shape neatly, and turn on a floured baking tray.

Continue on page 21

# WHAT IS MILK? (3)

## THE DIGESTION OF MILK

by MILKMAN

**M**ILK clots when it enters the stomach. This is due to the action of an enzyme—rennin. The clotting of milk converts the caseinogen into insoluble casein. The casein clot contracts into a tough mass which is subsequently digested. Infants secrete little pepsin in the stomach; the clot is digested in the small intestines. The biological significance of this clotting is not known but it is reputed to make milk less easily digested.

It can be partially prevented by diluting the milk with water, thus reducing the concentration of calcium which is necessary for the formation of the clot. Clotting can also be prevented by the addition of sodium citrate.

Both these means have been much used, but whether they increase the digestibility of milk is doubtful. Milk is, in fact, readily digested and absorbed, especially by infants and growing children.

Cow's milk—owing to its high protein content and its content of phosphate and citrate—exerts a strong buffering action, thus lowering the acidity of the gastric juice. It is perhaps for this reason that milk is often so effective in reducing the pain caused by a peptic ulcer and the associated hyperacidity.

### MILK PRODUCTS

Soured and fermented milks—in many countries, milk is drunk sour or curdled. Various bacteria are used for this purpose. All these bacteria cause a breakdown of the lactose in the milk with the formation of lactic acid.

The natural method of preparation is to boil the milk and somewhat reduce its volume. After cooling it is inoculated with a small portion of the previous day's milk as a starter. The souring

takes about 24 hours. Condensed and reconstituted dried milk can be used for the purpose. Commercial preparations of the bacteria cultures are also available as starters.

Sour milk yoghurt contains all the protein fat, calcium and vitamins of the original milk. It is a safe preparation in countries where standards of dairy hygiene are low, for the original milk is sterilised by boiling. There are many traditional forms of sour milk which are appreciated as national drinks.

Yoghurt is made in Greece, Romania, Hungary, Bulgaria, Turkey, the Caucasus and neighbouring countries. Cow, goat, sheep or buffalo milk may be used. If the milk has been much concentrated by boiling, the yoghurt is diluted with water for drinking and is then known as doogh in Afghanistan and Iran, or eyran in Turkey.

If souring is allowed to take place when the milk is warm (about 55° C.), a preparation known as laban is formed, which may contain a little alcohol from yeast fermentation. Kefir is a sour milk made in the Caucasus with yeast, with some an alcohol content. Kowmiss is a popular Russian drink prepared from mare's milk, which is rich in lactose.

It may contain up to 3 percent. Alcohol. Yoghurt, as usually prepared and obtained in Britain and the U.S.A., can, however, be safely consumed by the strict teetotaller.

The great Russian scientist Metchnikoff at the end of the nineteenth century conceived the idea that yoghurt was an elixir of life. His theory was that the putrefac-

tive bacteria present in the large intestine produce toxins that shorten life.

He thought that by taking yoghurt, the milk souring bacilli would become dominant in the intestine and oust the normal putrefactive bacteria. He himself took yoghurt regularly and established it as a fashion in many European cities. There was not a shred of evidence to support Metchnikoff's theory which is now quite discarded. Yoghurt is a nutritious and pleasant food, but has no unique nutritive properties.

Dahi is a sour milk preparation made in innumerable Indian homes. Whole milk is brought to the boil and then allowed to cool to about body temperature and kept at this heat in an earthen vessel. A small amount of yesterday's dahi is added as a starter.

When cool, dahi, is a delicious drink, especially in the hot weather, although perhaps an acquired taste for Europeans. The butter fat may be removed from dahi by churning and used to make ghee. The remaining sour milk is known as lassi; and is also a popular drink.

Buttermilk is a term which may be used in Europe for a variety of products. In Holland and Denmark it is prepared when sour cream is churned into butter, and is a popular drink.

Curds are the clotted proteins formed when fresh

milk is artificially inoculated with rennet (a commercial preparation of rennin, prepared either from calves' stomachs or vegetable sources).

Whey is the fluid that separates from the clot in making curds. It contains most of the lactose in the original milk, and a little lactalbumin, but almost no casein or fat; its nutritive value is therefore small.

Butter is discussed later in this chapter.

Cream contains all the fat and usually from one-third to half of the protein and lactose in milk. From time to time the British Government has laid down standards for the minimum fat content of cream.

The famous Devonshire cream or clotted cream is prepared by heating the milk in special pans. This brings about a rapid and effective separation of the fat. Devonshire cream may contain 60 per cent. of fat.

Skimmed milk is milk from which the fat has been removed in the making of butter or cream. It is a by-product of the butter industry and since it is readily dried, large quantities of the dried product are available on the world market.

JOHN PLOWMAN,  
Fellow of the Guild of Agricultural Journalists writes on

## ADVANCES IN BRITISH PIG BREEDING



**ALTHOUGH BRITAIN IS A SMALL COUNTRY IT HAS A GREAT VARIETY OF INDIGENOUS BREEDS OF PIGS, EACH WITH ITS OWN SPECIAL CHARACTERISTICS, AND THIS HAS BENEFITED BOTH ITS FARMING INDUSTRY AND THAT OF MANY OTHER PARTS OF THE WORLD.**

In some cases, breeds now reduced to small numbers in Britain have proved so valuable under different conditions that they provide the main blood of pig populations thousands of miles from their original home.

This has happened, for instance, with the Tamworth. Only a handful of herds, retained by enthusiasts, remain in England, but the breed has become important in Australia, Canada, New Zealand and the United States. The Berkshire, too, has lost much of its former favour at home but has established itself in America and elsewhere. Others, such as the National Long White Lopped, the Lincolnshire Curly Coat and the Gloucester Old Spot are now rarely kept on a commercial scale in Britain.

### DOMINATING BREEDS

The need for a white-skinned pig for the Wiltshire type of bacon cure has been a big factor in the decline of coloured breeds, though some are still retained for their good breeding characteristics, especially for crossing purposes.

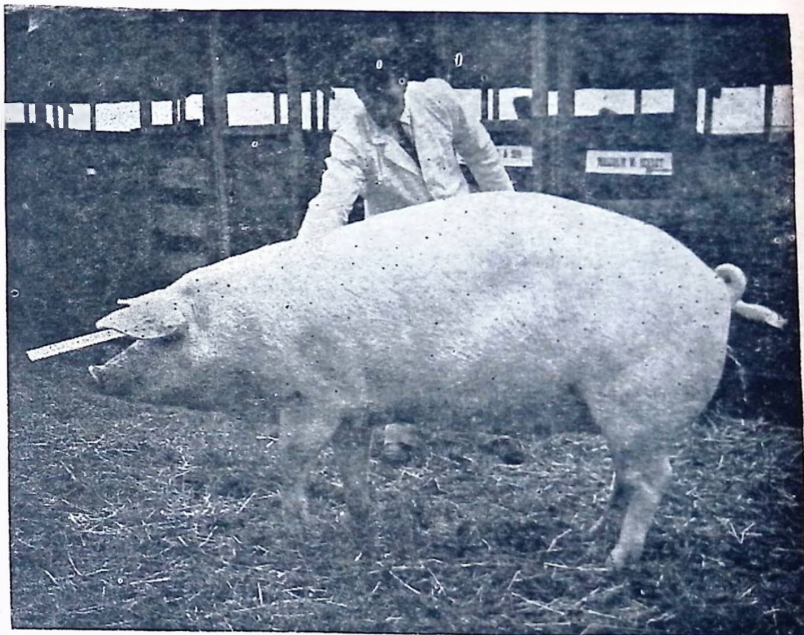
Two breeds dominate the British pig industry today, the large White and the

there is such a range of strains within the breed that a type can be selected to suit virtually any climatic conditions. It is derived from the British Yorkshire breed, by which name it is better known in most other countries.

The British Landrace has

### LEAN BACON AND PORK

It may be a matter of has been so successful that the Welsh has come to occupy the third most important place in Britain.



A 'Champion' sow owned by Mr. Malcolm W. Exkey seen beside her,

British Landrace, both of which are all-white.

The large White is not only the biggest breed in the United Kingdom but it is probably the most widely distributed in the world. This is unquestionable because

sprung to prominence in little more than ten years, largely due to its length and leanness, features that are so suitable for bacon production, and it is now the country's second most popular breed. It has also been used to improve the indigenous Welsh. This

personal preference which breed is chosen by the pig keeper—whether he breeds or buys his stock—but ultimately his choice will be dictated by economic considerations.

If he is a breeder, he will seek high performance from his breeding stock as well

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Dozens of modern workers' settlements with all the necessary cultural and welfare establishments and enterprises have sprung up here.

Another 120 million rubles will be invested this year for the further development of the steppe-land.

Until recently, the Central-Asian republics and the Transcaucasus were considered the traditional irrigation-farming regions, and practically all irrigation construction work was concentrated here. At present the picture has changed considerably.

Alongside with continued irrigation work in the old areas, the volume of agricultural development will be increased in arid regions of the Russian Federation, the Southern Ukraine and Moldavia, also in the Northern Caucasus, along the Volga and in western regions of Kazakhstan.

Large bases are being created here for the production of commodity grain. Much irrigation work is being carried out in the Far East for the production of rice, vegetables, fodder and other crops.

In the next decade the country's irrigated area will be increasing by 7-8 million hectares, and the drained area by 15-16 million hectares, while the total reclaimed land will reach 37-39 million hectares in 1975, against 15 million in 1966.

Continued from page 8

## PLANNING A LAYING UNIT (2)

After 24 weeks of age egg sales exceed current expenses, and the amount remaining invested in the bird is reduced, until at the end of the laying year the farmer has got back his initial investment and a profit besides.

The total capital invested in birds, apart from land, services and buildings, depends on the farm plan as well as on the number of birds to be kept. Under Plan A (see *December issue*) the rearing house is shared by three lots of layers.

Also only  $\frac{1}{3}$  of the birds are at point of lay at any one time, and the farmer gets back some of his investment in those which start laying first before he has to meet all the expenses of the next batch. For example think of three flocks of 100 birds each on Plan A (see *January issue*)

1 flock being sold at end of lay = 4/- per bird gain  $\times$  100 birds.

1 flock at 52 weeks old = investment repaid by egg sales.

1 flock at 32 weeks old = 12/- still invested in these birds.

1 flock growers 12 weeks old = 10/- per bird invested so far.

Total investment in birds (4/-, & 12/-, & 10/-)  $\times$  100 birds equals £80.

Three laying houses at £1 per bird = 3  $\times$  £100 = £300,

One rearing house at 15/- per bird = 1  $\times$  £75 = £75

Total invested = £455 birds and buildings.

On Plan B (see *January issue*) the most expensive time for the farmer is when the second lot of birds are 24 weeks old. To have the same 300 layers on Plan B needs 2 laying houses each of 150 birds and two rearing houses each of 150 birds.

Flock 1: 32 weeks old = 12/- per bird invested.

Flock 2: 24 weeks old = 17/- per bird invested.

£ s. d.

Total invested in birds (12/-, & 17/-)  $\times$  150 birds = 217 10 0

Laying houses, 2  $\times$  150 bird houses at £1 = 300 0 0

Rearing houses, 2  $\times$  150 bird houses at 15/- = 225 0 0

Total invested in birds and buildings = 742 10 0

Plan B is therefore quite a lot more expensive for the same number of birds than Plan A and is only worth using if higher profits, due to higher prices, can be got by using it.

Continue from page 11

## POULTRY

tender-meated, heavy-weight chickens are higher than the corresponding costs of raising broilers. Therefore, roasters and capons sell at a higher price per pound.

The market for roasters and capons is relatively undeveloped, but has a good potential. Farm production of these speciality products should increase significantly in areas where consumer demand can be built up, i.e. near schools, colleges, a university or a hospital.

## COSTS

Feed is a major expense in poultry production. It amounts to about 55 percent of the total cost of producing market eggs, 65 percent of the cost of producing meat-type birds, and 55 percent of the cost of producing hatching eggs.

The age and breeding of

chickens determine their purchase price. Highest purchase prices are charged for ready-to-lay pullets. Day-old sexed pullet chicks sell for 25 to 30 percent of the cost of ready-to-lay pullets of the same breeding.

Normal expenses of a farm flock—in addition to feed and birds include housing, equipment, vaccines and drugs, fuel, electricity, labour, taxes, interest, and depreciation.

Accurate records are essential in figuring costs and determining efficiency. Records also can be used to improve operations.

## THE FARM LAYING FLOCK

Start the laying flock with top-quality, healthy birds that have been developed for a high rate of production throughout the year. With proper management, bred-to-lay birds produce eggs of superior size and quality.

Before buying birds, decide whether you want white or brown eggs. The colour of the eggshell does not effect food value, but it does influence the market price. In some countries white-shelled eggs sell for slightly more than brown-shelled eggs. In others, where brown eggs are preferred, the situation is reversed.

Birds that weigh 4 to 4½ pounds at maturity are considered light-weight breeds. They usually lay white eggs. White Leghorn first-generation strain crosses and crosses of inbred lines are the most popular light-weight varieties for laying flocks.

Medium-weight breeds usually lay brown eggs. Popular medium-weight egg-laying breeds are New Hampshires, Plymouth Rocks, Rhode Island Reds, and first-generation egg-production crossbreeds.

## EGG-LAYING TESTS

Random-Sample Egg-Production Tests are conducted in many countries. These tests are designed to provide a reliable guide to the performance of laying stocks offered for sale by breeders and vatcherymen. The tests provide information on all important economic traits of poultry.

## SOURCE

Large commercial hatcheries have taken over most of the hatching formerly done on the farm or at small community hatcheries. In most cases, farm hatching is no longer profitable. Commercial hatcheries sell day-old chicks of high quality for less than it would cost to produce chicks in a farm incubator.

Get your stock from the nearest source that offers birds with the traits you want. The shorter the distance your birds must travel to the farm, the fewer your losses.

It is a good idea to investigate the local reputation—as well as the breeding, sanitation, and management practices—of the hatchery or grower before placing an order for chickens.

To find out more about the kind of birds suited to your needs, talk with your state agricultural agent, a poultry specialist, or successful poultrymen in your area.

## GETTING STARTED

Begin planning for the flock at least 6 months before you want the chickens on your farm. Select the age of birds that are best suited to your production timetable, your houses and equipment and local conditions. Order chicks at least 4 weeks in advance; order started pullets at least 3 months before you need them; order ready-to-lay pullets at least 6 months ahead.

Continue overleaf

Continued from overleaf

**POULTRY MANAGEMENT**

Plan to keep only one age of bird in a flock at one time. If you must have birds of several ages on the farm, keep each age group separated to help reduce diseases.

**BABY CHICKS :**

Baby chicks usually leave the hatchery when they are 1 day old. They normally require heat during the early weeks. They sometimes are vaccinated, dubbed, sexed, and debeaked at the hatchery.

Straight-run chicks cost less than other ages and types of live birds. Straight-run birds are boxed at random as they come from the incubator ; normally, about half the chicks are pullets and half are cockerels. When space and labour are available on the farm, cockerels of medium-weight breeds may be grown as meat-type birds at the same time that pullets are grown as layers. Sometimes, cockerels of superior strains are raised as breeding stock.

Sexed chicks are sorted after they leave the incubator into lots of pullets and cockerels. Sexed pullets of light-weight breeds cost more than twice as much as straight-run chicks ; sexed pullets of medium-weight breeds—while usually not as expensive as light weight breeds—cost more than straight-run chicks.

**STARTED BIRDS**

Sale of started birds are increasing. These chickens, which have been brooded and no longer need supplemental heat, require less equipments and less care than younger bird.

In many sections of the country, started pullets are available from growers who specialize in their production. There should be an understanding between the buyer and the grower concerning the

strain or cross of the started pullets, the type and number of vaccinations, the kind of feed, and the disease history of the birds.

Started pullets usually are sold between 6 and 8 weeks of age. Individual lots may vary with seasonal needs for heat. Their high purchase price reflects the costs involved in getting the birds through brooding.

Ready-to-lay pullets are sold at 16 to 20 weeks of age. They begin to lay almost as soon as they reach the farm. Ready-to-lay pullets sell for more than any other age group of similar quality birds because they have been raised through their unproductive month.

**NUMBER**

Plan to fill your laying house without overcrowding. In determining the number of birds you need, allow for normal losses from diseases, natural causes, and culling.

For each 100 layers you want in your flock, start with—

- \* 220 straight-run chicks (day old) or
- \* 110 sexed pullets (day old) or
- \* 105 started pullets (6 weeks old) or
- \* 100 ready-to-lay pullets.

**HOUSING**

Birds of different ages always should be housed, separately.

The trend is toward raising poultry entirely in confinement. Two systems may be used :

- \* Floor housing (sometimes called litter or "loose" housing).
- \* Cages.

Floor housing allows birds to move freely on the floor of the poultry house, or inside pens that divide large floor areas into manageable units. This system may be

adapted to brooding, growing, and keeping any type of poultry flock—layers, breeders, broilers, capons, or roasters. It is particularly suited for

Cage raising methods are best adapted to situations where land is limited. Laying hens in cooler areas can be housed in cages if :—

- \* The house is well insulated.
- \* Ventilation is controlled.

The house is filled to capacity so that the hens' bodies provide the necessary heat to maintain a minimum temperature range of 45° to 55° F.

The cage method is not always economically sound. Flies and excessive odour can be a problem with cages.

Continue from page 13

**TREE FARMS**

can be made from wood, Mr. McClelland said. "A few years ago, when pain relievers and paper clothing joined this list, it was believed that saturation point had been reached. Not so.

"To add more glamour, durability and usefulness to an already versatile material, research chemists are bombarding plastic-impregnated wood with atomic radiation to make it almost indestructible.

"Scientists are treating wood so that it will be more resistant to fire and attacks by fungi and insects. Giant arches and timbers are being built by glueing small pieces together in presses.

"Research discoveries have proved that health and vigour can be bred into trees, and that it is possible to grow forests of bigger sturdier trees of better quality in a shorter time than ever before.

"Studies of wood are providing us with thousands of

useful and beautiful products which are continually being improved. Wood awaits only the magic of more research to exploit its almost unlimited potential in the modern world."

**PRECIOUS RESOURCE**

Wood is such a precious resource that very little of it is being wasted today. In some operations, as much as 90 percent of the fibre finds its way into useful products. Leftovers in the logging and milling processes, once burned or abandoned to rot in the woods, are now providing more than 50 percent of the pulpwood used for making paper.

Formerly, logs are made into lumber, the bark is removed so that all unused slabs, trimmings and edgings may be cut into small chips and made into pulp, paper or pressed-wood products called hardboard, particleboard and flakeboard.

Now, bark is converted into insulating material, clothing, mulch or fertilizer.

Sawdust and shavings may be compressed into fuel logs and fuel briquettes."

Conservation of wood even includes the mechanical filling of knotholes in plywoods, thus turning former leftover wood into consumer products.

**READ AND**

**ADVERTISE**

**REGULARLY**

IN

**FARMSTOCK**

Continued from page 15 Fancy shapes of Vienna bread

**BREAD**

4. Bake in a hot oven for 30 minutes.

NOTE: This is not as digestible as fermented bread, but is a pleasant change to bread raised with yeast.

**Vienna Bread****Proportions :**

1 lb Vienna flour, 1 Teaspoon Castor Sugar.

1 oz butter, ½ oz compress-edyeast.

1 Teaspoonful salt, ½ pint milk.

1 egg.

**Method**

1. Sieve flour and salt into a warm basin and rub in the butter.
2. Cream the yeast and sugar, warm the milk, add the beaten egg and mix with the yeast, strain into the flour mix and beat to a smooth dough with the hand or large wooden spoon, until the dough leaves the sides of the basin clean.
3. Cut dough across the top, cover with a cloth, and set to rise in a warm place for about 1 hour.
4. Turn on to a floured board, knead lightly, and form into fancy shapes, rolls, twists, horseshoes etc.
5. Put the bread on a greased and floured tin, and set it to "prove" in a warm place for 15 minutes.



6. Brush over with beaten egg and bake in a quick oven for about 20 minutes when sufficiently baked the rolls should be nice brown and light.

For best results in baking bread an even and steady temperature should be maintained in the oven and the oven should not be too cool nor too hot, the flavour of bread is spoiled if the ingredients are not fresh and of good quality.

A recipe for white bread has been omitted as this is common enough. Of course the shape of the bread can be varied as we have in the cottage loaf, and a fresh loaf from the oven with a spread of butter can be tasty.

Continued from page 17

**PIG BREEDING**

So the scientists have built-on and greatly extended the work started by the great British livestock improvers of the eighteenth and nineteenth centuries. Experimentation in feeding and housing, recording schemes and progeny testing have all contributed to the overall improvements in pig performance. Artificial insemination (A.I.), which is playing an important part in cattle improvement in Britain, is also being used with notable success to upgrade the national pig herd.

**NEW SCHEME**

The Pig Industry Development Authority (P.I.D.A.), now part of the new Meat and Livestock Commission, operates progeny and boar testing and A. I. stations, and many commercial concerns are engaged in various aspects of research aimed at producing better, more profitable pigs.

As the general level of pig population has improved, ideas of quality have become more closely defined and grading more stringent. For this reason, a new scheme

including a more comprehensive form of testing was introduced by P.I.D.A. just over a year ago. The Accreditation Scheme, as it is called, has the aim of making available to the whole industry "pigs which are genetically capable of producing better carcasses more cheaply."

The scheme classified herds with a high level of recorded performance as either Elite or Accredited. Out of a total 213 herds participating at present, 38 Large White and 23 Landrace have Elite status. In the Accredited section, 82 herds are Large White and 51 Landrace.

Boar performance is tested through progeny groups of four litter mates, two boars, one castrate and a gilt. The latest report on the scheme shows that boars from the Large White test groups had an average food conversion of 2.93 compared with 3.09 for the Landrace. Large Whites also had a slightly better average daily live-weight gain of 1.58 lb. (0.711 kilogrammes), compared with 1.52 lb. (0.684 kilogrammes) averaged by Landrace.

On the other hand, the Landrace produced longer carcasses and their killing out percentage was marginally better. It was concluded that the Large White boars were less variable than the Land-

race.

**SPECIALIST PRODUCERS**

Already, the scheme is producing tested boars whose male and female progeny are improving standards in herds all over the country. One estimation suggests that the benefits of the scheme will become apparent throughout commercial herds within two years and that a sow considered poor in 1972 will have a better performance than today's average.

Pig production in Britain has become a highly specialised enterprise and cannot be undertaken lightly if the producer experts to succeed.

The national breeding herd now stands at some 721,000 females and 36,000 boars, producing 12,500,000 pigs a year for slaughter. As in the dairying industry, there is a trend to larger herds owned by fewer but specialist producers. Now nearly 30 per cent. of pigs are kept in herds of over 500 compared with 12 per cent. eight years ago.

Ever since the British producers of constructive breeding began to improve the physical and economic characters of pigs, other countries have shared with the home industry the fruits of this work. There can be no doubt that this will continue to be the case in the more rapid advances that are being made today.

# LAUGH !!!

"Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

**T**WO children, Asu (6) and Efi-boy (4) had an orange given to them by their mother to share between themselves. Asu was to do the sharing. Their mother had told them several times previously that anyone of them who had anything to share with the other must retain the smaller portion for himself and give the bigger portion to his brother.

all alone.

With tears in his eyes, Efi-boy went to their mother and made the complaint. "Asu" called the mother, "why didn't you give Efi-boy part of the orange?" "Mummy" replied Asu, "he wanted the lion's share of the orange, and since lion's don't eat oranges, he had no share."

Efi-boy reminded Asu about this and said, "So you must give me the lion's share of the orange." Do you really want the lion's share of the orange?" asked Asu. "Yes, of course," replied Efi-boy. Instead of cutting the orange into two as he originally intended, Asu sat down quietly and ate it

**W**HEN Lord Bessborough died some years ago, The Times published in error the obituary of Lord Desborough. Somewhat taken aback, Desborough telephoned the newspaper to report that he had just read his own obituary. A grand voice replied, "I see, sir. And where are you speaking from?"

nails and popped in her contact lenses.

Finally, she looked into her mirror and said with a satisfied sigh, "Well! Tonight they're going to see the real me!"

**W**HEN the people down the road returned from their holidays, their little daughter was heard to exclaim, "Look, Daddy, you forgot to turn off the grass!"

**T**WO friends who had been without food throughout their journey, finally arrived, and were waiting in a cafe to be served. Presently the waiter came in with a dish of yam cake, one side of which was badly burnt. The waiter placed the dish on the table between them with the burnt side facing one of them.

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**CIRCULATION MANAGER,  
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EBUTE-METTA.**

**A**BUSINESSMAN explains why Lagos men love the really short skirts worn there. "At last, men on the buses during the rush hour can get seats," he said. "The girls are afraid to sit down."

**O**NE SATURDAY afternoon my wife and I were gardening when we saw a removals van arrive next door. Grubby as we were, we hastened over to greet our new neighbours. The following week, they invited us to a house-warming party.

As we dressed, I watched in fascination as my wife put on her hairpiece, struggled into a girdle, painted her lips, applied eye shadow and false eyelashes, varnished her finger-

Ayo, who was facing the burnt side of the yam cake thought for a while and then said to his friend "By the way, Olu! do you know what the scientists are trying to do now-a-days?" "No," replied Olu. "Well," said Ayo, "they are trying to turn the world upside down like this." As he said so, he demonstrated by turning the burnt side of the cake now to face his friend.

Olu stared at him, stared at the cake the burnt side of which was now facing him, then stared at him again, and asked, "By the way, Ayo, are you now a scientist?" "No" replied Ayo. "Well! I eave the blooming world where it was," said Olu, turning the cake back to it's original position.

**A**N arrival at the Idah Terminal of the Nigerian Railway Corporation, Mallam Tanko was lucky to get a porter who went out of his way to help him with his many luggages. As he went out from the railway station he said to the porter. "I am very happy about the way you have helped me with my luggages."

I should have given you some monetary reward, but I see written on your cash. N.R.C. meaning 'not receiving cash.' "Sorry sir! you've got it wrong," said the porter promptly, "it means: never refuse cash."

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# FARMSTOCK

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# FARMSTOCK

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Report of Animal Husbandry in Nigeria Centres-press

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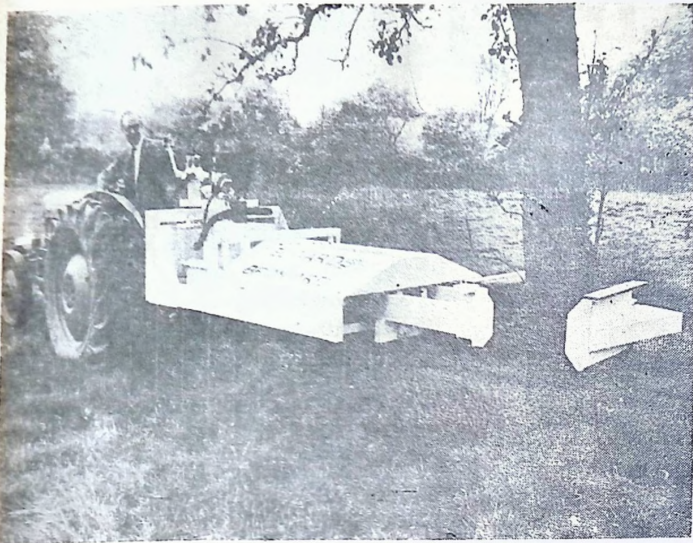
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MANAGING EDITOR  
Abiodun Ojugbele

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## New Equipment



### TREE SHAKER

MR. H. A. EDWARDS DEMONSTRATES THE NEW FRUIT HARVESTER DEVELOPED BY HIS COMPANY IN HEREFORDSHIRE, ENGLAND. THE SHAKER GRIPS THE TREE WITH A RUBBER PADDED HYDRAULIC CLAW, WHICH IS ADJUSTED TO AVOID DAMAGE TO THE BARK.

The shivering action of the machine then shakes the fruit into a canvas container draped round the trunk under the lower branches. The shaker is hydraulically driven

and cantilevered from the tractor by the normal three-point linkage. According to the manufacturer, trees can be cleared in a matter of seconds.

The machine weighs only 950 lbs (about 430 kilograms) and can be worked by medium tractors of 35 to 45 brake horse-power. Being both cheap and light, it makes the shaking method of harvesting a feasible method for small growers for the first time

The shaker has successfully been used for trial harvesting of cider apple crops; though not suitable for universal application, it will deal with nuts, plums, olives and fur cones.

The machine offers considerable saving on traditional harvesting costs and obviates the possibility of damage to the tree by pickers or their ladders and poles.

Manufacturer: Mr. H. A. Edwards, Collington Works, Bromyard, Hereford, England

### CONTINUOUS ACTION PUMPING UNIT FOR ORCHARDS AND GARDENS

A CONTINUOUS action syringe-type pumping unit which is fitted with a shoulder mounted knapsack type container and is designed for use in gardens, orchards and soft fruit plantations, has been developed by a British firm. Either fungicides or insecticides can be sprayed.

Made of brass, the pump has a built-in air bottle to give the full spray output irrespective of the position of the plunger.

Continue on page 7

### RIDGING PLOUGH

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### THE MANAGER

59 Tafawa Balewa Road  
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Kano.

The Company also wishes to inform the General Public of its REPETITION OF 1968 RURAL DEVELOPMENT DEMONSTRATION which will take place from 5th to 13th April, 1969, in Kano.

### New Cotton Variety

SCIENTISTS of the Iolotan Plant-Breeding Station, in Turkmenia, evolved a new variety of Soviet fine-fibrous cotton. It ripens five days earlier than the local cotton. The weight of the boll reaches 3.5-4 grams, and the yield per hectare is 34 centners.

The new variety is valued mostly for its resistance to fusarium wilt. Many years' data show that this disease affects from 2 to 8 per cent of the crop.

Another merit of this new cotton is its superior fibre quality.

Agrotechnical methods have been worked out at the station for its cultivation, thickness of stand per hectare, and its watering. The new variety will help boost the output of fine-fleeced cotton in Turkmenia to 150,000 tons in the next few years.

# POULTRY BREEDERS'

## SUCCESSES WITH

### HYBRID BIRDS

FOR conversion of animal feeds into high quality protein for human consumption the modern chicken is unbeatable, and it has a guaranteed position in the economy of every country.

Hybrids being developed today can produce their own weight in eggs every five or six weeks, and Britain's breeders are developing strains which will do the same job even more efficiently.

ders is aimed at finding birds which will produce eggs efficiently on commercial farms in many parts of the world. The birds which usually are in intensive units either in batteries or on deep litter, must therefore possess the vital qualities of livability and resistance to disease, as well as the ability to convert feed efficiently.

On these factors British breeders excel, and in their

BY

A. ROSS MUIR

Improved strains are mainly developed by population genetics, in which many thousands of birds are tested and all but the top few percent, are rejected from the breeding programme. Lines outstanding in particular qualities are isolated, and scientific crossing of them produces the highly efficient hybrids.

#### VITAL QUALITIES

The work of British breed-

- Live Chickens
- Oven - Ready
- Eggs (all sizes)

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Lagos.

work they cater for conditions where management standards may not be as high as in British units with many years of experience.

All the British breeders offer the light white-egg laying hybrids of the Leghorn type. They weigh around 4 to 4.5 pounds (1.8 to 2 kilograms) and lay more than 260 eggs in 12 months under ideal conditions, with as little as four inches (10 centimetres) of trough space per bird in batteries.

But half of the British demand for chicks is in the brown-egg strains and Britain has excelled in the production of these birds. They have different characteristics from those of the Leghorn type and may well be more suitable for some conditions where quality of feed is low, and management is not too experienced.

British chick breeding has gone on two different lines, and both are being developed and refined on a continuing programme by each of the four main home sellers on the United Kingdom market.



One of the latest hybrid hens developed by Thornber Brothers Ltd., of Yorkshire, northeast England is the New 404 Plus, pictured here. Field tests have shown it to have an average production of -246 eggs a year, six more than the 404 it replaces.

#### VALUABLE CARCASS

The brown-egg laying strains have improved remarkably in recent years and they perform only slightly less efficiently than the Leghorn types. The farmer under British conditions can expect 240 eggs in a year from this type of bird with a feed consumption of around 4.5 ounces (127 grammes) a day.

One of the advantages of these birds is the fact that the final carcass—around 5

pounds (2.3 kg)—is more valuable than that from the light hybrid.

Because management conditions and standards vary it is important to offer farmers a choice of birds. Where good management prevails the Leghorn type is ideal.

But when management is likely to go wrong this type of bird can develop vices like feather picking, which is unlikely to occur with the brown strains.

Continue from page 1

# LETTERS

Sir,

WHILE I do not grudge anyone for doing what one likes, it strikes me painfully that no one has thought of setting up a feed factory.

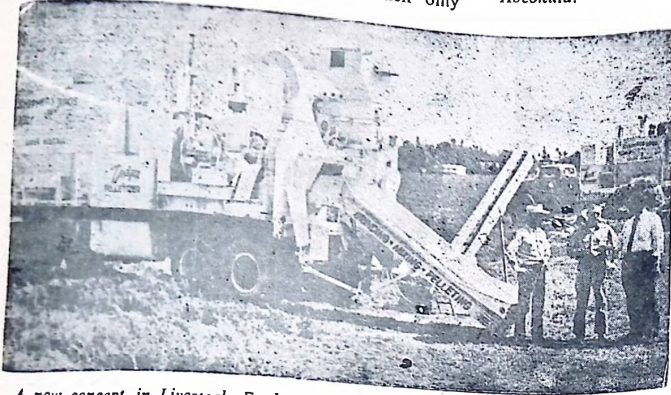
It cannot be gainsaid that

## Animal Feed

the country needs many commercial feed compounders. Without competition, one is bound to have unbridled rising of prices when only

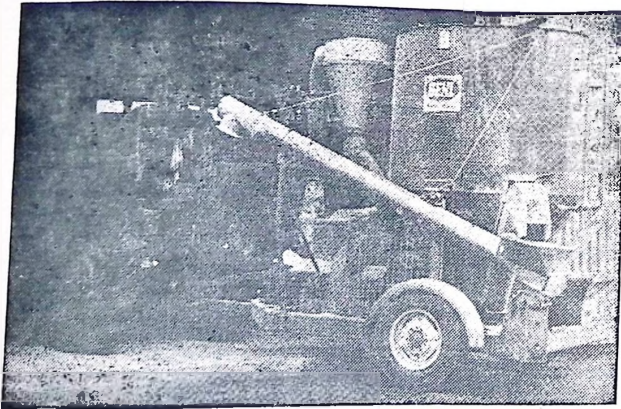
one firm is operating in as huge a market as Nigeria. One can imagine the glow of a lone star in the sky.

Dauda 'Nekan  
Abeokuta.



A new concept in Livestock Feeds processing and manufacturing that can start making money for its investors immediately. The unit, mounted on a lorry goes to any location, grinds, mixes and weighs any feedstuffs, makes any size pellet to any desired formula at savings up to four pounds per ton or more. The Nigerian representatives of the dealers are Messrs Shonubi Stores Ltd. P. O. Box 1039, Yaba.

## AND FOR THE SMALL FARMER



A mizey which incorporates a hammer mill with a plain feed table, ladder, 10ft discharge conveyor, universal power take-off drive from the tractor, safety shear pin and discharge system clutch. The unit costs about £800.

## FISH ; WHAT IS IT ?

Sir, OUR recent series on BREAD made very interesting reading. What if you publish some similar matter on fish.

Many people think only of fish when meat is scarce or when they are temporarily tired of the jaw and tissue tug-of-war.

Now that fresh fish and frozen fish flood our markets, you need to help both the public and the fish mongers too by publishing in simple language some matter on fish. Thanks indeed please in advance.

Bordo Breme

Sapele.

## FARM SCRAMBLE

Sir, IT looks there is going to be a mad rush BACK TO THE LAND soon. The coming out of FARMSTOCK is very timely. Almost every week-end now, one sees convoys of cars and cars on our up-country roads.

They are not going anywhere but farms. The flow is a gentle ripple now, it will soon turn to a fever. This reminds one of the search for constituencies by political candidates.

Ayinde Opeji

Obafemi.

## GARI FROM POTATO?

SUB-SECTION of a news item of your last month's issue (Farmstock Feb '69) says that American Agronomists are striving to produce gari from potato.

Now that the spirit of carver has woken up again to produce for humanity, will you please—Mr. Editor—pass my cheers to these Americans.

The more sources of food particularly the staple foods, the better. And times is up or a substitute for casava—our untiring support let the Americans tell us more about this potato gari please.

Bob Sonaike

Ijebu-Igbo.

## INVEST IN RABBITS AND **OWN A MONEY SPINNING BUSINESS**

It is striking indeed that very few have ever thought of rabbits and fewer still have ever started owning even a few rabbits.

But rabbits are very easy to keep. They are quiet and readily cared for. And what is more, they breed at a terrific rate. Sample their sweet tender meat. Picture (right) shows a new specie of English rabbits that can be bred on wire floors as poultry.

Their breeders say a doe can be mated as many as nine times a year at an annual minimum average of 55 or a maximum of 80.

What of marketing? Easy. Apart from an insatiable demand by individuals, families and caterers, our universities



are good markets too.

If you want quick returns from a few

hours, spend such time on rabbits please.

For further particulars about rabbits, if you

wish to own them please contact Advert 8 Farmstock, P. O. Box 79 E. B.

Continue from page 4

### NEW EQUIPMENT

The pump is fitted with an 'O' ring in place of the more usual two-cup washer system, and this, the firm claims, ensures a longer working life with less chance of leakage.

An adjustable nozzle for a fine mist or single jet is fitted as standard. The plastics knapsack container has a capacity of 3½ gal. (24 litres) and is moulded for a comfortable fit on an operator's back.

(E. Allman and Co. Ltd., Birdham Road, Chichester, Sussex, England; product is the Gardenspray; price £7 f.o.b. London.)

### NEW EFFECTIVE FERTILISER

UCH fertilisers are required for the normal growth and development of plants. But the three basic elements—nitrogen, phosphorus and potassium are needed most of all.

industry produced fertilisers containing only one nutritional element. Most soils, however, require all three elements. This complicated matters for the farmers, inasmuch as they had to either apply fertilisers three times, or else prepare a mixture of the three.

It demanded additional work and means, when they had little time to spare. Moreover, the prepared mixture caked quickly and made their application difficult.

Soviet fertiliser factories now put out mixture containing all the needed nutritional elements required by plants. One of them is called "introphoska," which is very popular with the farmers. It is a granulated fertiliser with a nutrient content of 40 to 50 per cent.

Introphoska is delivered in bags weighing from 40 to 50 kilograms. The first experiment with the new fertilisers proved their high economic

Continue from page 5

### HYBRID BIRDS

In Britain, birds are bred to thrive under modern battery and deep litter conditions, and large scale testing programmes are continually conducted to allow the UK breeders to give detailed recommendations to customers both at home and abroad.

To achieve optimum performance from birds, it is vital to know their exact requirements for food and light at each stage of their development. It is well known that unless a bird is on the correct lighting pattern during its first 18 or 20 weeks, it will never be able to express its genetic potential.

The major British breeds tend to be early maturing. This ensures that the rearing period is shorter than by international standards and birds begin their production cycles more quickly.

The four main breeders—Thornbros, Sterling, Double "A", and Sykes—have quite

strong position in the British market against international competition; and all four have introduced new and refined birds designed for present day conditions.

### DISEASE RESEARCH

F. and G. Sykes, who produce Hybrid Three, one of the most prolific laying strains in the world, is also leading in the practical research into the control of Marek's disease, a cancerous condition which, in its acute form, can cause high percentage mortality.

The programme involves the identification of strains which are resistant to the disease and the breeding work continues from there.

The "mini" layer is a regular talking point throughout the world. The "mini" has a dwarf factor, but still lays a large number of eggs, and many international organisations are moving towards this goal. One, in fact, hopes to market a 2½ pounds (1.1 kg) layer in the very near future. British breeders are also in the race, and two of them

L. J. Elmslie discusses

# WHICH SYSTEM FOR LAYING ?

**T**HERE are a great many ways of keeping laying birds. In the beginning all hens were kept on "free range", that is allowed to wander about looking for food anywhere they could find it.

As long as flocks of birds were small they could get quite a lot of their food in that way, but a big flock can not be kept in that way without a lot of special feeding.

Free range was the only possible system at one time before bird nutrition was well understood, but now we know exactly how much of all the various vitamins, minerals, amino acids to put in a ration, and do not need to let the bird look for them in insects seeds and so on that it can pick up from range.

So we can keep birds inside all the time and so have much better control of them ; there are fewer deaths, more eggs laid and fewer lost.

Several systems have tried for keeping birds inside. Only two have really become popular. The first successful system was Deep Litter, but Battery cages are now more popular.

In America about half the layers are kept on each system; in Britain 80% of the layers are in cages, and in both countries the proportion of cages is increasing. Both systems can be used for growers as well as for layers, but different cages and equipment are needed for the younger birds.

A great deal can be and has been written about poultry management on each system and about the modifications of each to give the best results.

Such points may be discussed in later articles in this series, but first let us look at the advantages and disadvantages of each system, and compare them.

## A. NUTRITION

Birds on deep litter have the advantage of being able to walk about, scratch and eat small things from the litter. The litter is rich in vitamin B12, the "Animal Protein Factor", and before this vitamin was discovered birds on litter often did better than those in cages.

Nowadays sufficient B12 is included in all poultry rations and the extra in the litter is of no practical benefit. The exercise obtained by birds on

litter was also important in the old days.

Weak legs due to "Cage Layer Fatigue" were common in cages, but increased knowledge of nutrition, particularly the calcium, vitamin D and phosphorus requirements, has virtually eliminated this disease, and the advantage of the deep litter system has disappeared.

Food consumption is higher on deep litter than in cages for two quite separate reasons. The first is that birds need more food to supply the energy used in moving about on the litter. The second is that food waste is greater on deep litter than in battery cages.

The amount of waste varies enormously with the type of trough used in each case, but while feed waste can be reduced to less than 1% in batteries even the best troughs waste about 3½% on litter.

The result is that deep litter birds use at least ¼ ounce of food a day more than they would if kept in cages, which amounts to at least 5½ lbs. of food worth 1/10d. a bird over a laying year. Poor feed trough design may double that figure.

## B. HEALTH

On the deep litter system the bird is always scratching about among its own droppings. Obviously this means a risk of disease especially of various kinds of worms and coccidiosis.

It is only surprising that these diseases are not worse than they are. The reason is that as the droppings decompose in the litter conditions become unfavourable to worm eggs and the "oocysts" of coccidia, so that most of them are killed.

However there is always a danger from these diseases especially if the litter becomes wet, near drinkers for example. Droppings borne diseases are avoided entirely in cages.

Other disease problems on litter which are reduced in cages are the leucosis complex, and Chronic Respiratory Disease. The leucosis viruses

are carried by the beetles found in the litter, and Chronic Respiratory Disease is made worse by the dust the birds breathe in from the litter.

In very young chicks Aspergillus infection from the litter can be very serious, especially during the rainy season.

## C. PRODUCTION

Provided that there are no disease problems egg production is as good or even better from litter than from cages. However light infestations of worms and other diseases are so common that average production is definitely less. Egg size is similar.

There are usually more cracked eggs in cages than on litter, but a lot depends on the cage floor (3% would be an average difference between the two systems). Battery eggs are easier to keep clean.

## D. LABOUR

There is little difference in labour requirements between litter and unmechanised cages. The need to clean out cages every week or thereabouts is a disadvantage for farmers who have trouble getting rid of the droppings, but litter only needs cleaning out annually.

Continue Next page.

# NEWS

## PANKSHIN AGRIC SHOW

Another Agricultural Show to boost farming and promote modern methods among local farmers of the Plateau Province has come off successfully recently.

One of the highlights of the show was the selection of Miss Cordelia Ali as "Miss Agriculture Show"

## ARGUNGU FISH FESTIVAL

Thousands watched the much awaited annual Fish Festival at Argungu recently. Among the enthusiastic crowd were members of the International Observer team, school children and high ranking civil servants.

The biggest fish caught at the show weighed 132 pounds

IFE UNIVERSITY AND

## AGRICULTURE

The Vice-Chancellor of the University of Ife Dr. H. O. Oluwasami has announced that new courses in Agriculture would start soon.

The courses, Food Science and Technology, will help the country immensely according to informed circles.

## FARMING BRIEFS

### PRODUCE AND OIL

A recent release from the Nigeria Produce Marketing Board disclosed that Nigeria's total earning from produce amounted to five million pounds (£5 million).

Produce Oil and extracts have also been earning Nigeria an average of six million pounds annually (£6 million) stated another release from the Vegetable Oil Nigeria Company Limited.

### GOVERNMENT TO BOOST AGRICULTURE IN RIVERS

The Government of the South Eastern State is planning a big boost for all facets of Agriculture according to a recent State release.

To this end, young seedlings, seeds, dry old-chick and fertilizers have been acquired as the nucleus of the agricultural revival.

ting the crops

20,000 hectares of cereals are to be mowed and thrashed by the corn-growers of the Pri-ishimsky States Farm, North Kazakh Region. Nearly 100 combines and 90 trucks work in the fields of the farm every day now. Grain harvesting and windrow picking-up are performed by the group method. They have decided to harvest the whole area in 25 days and pass over to the state 1,346,000 poods of grain (one pood-36 lb).

Cover pictures shows team 9 of the state farms during grain harvesting Kurmagali Suraganov, an experienced combine operator and the Hero of Socialist Labour, is the team leader.

## KWARA STATE TO CHAMPION COURSE OF AGRICULTURE

The Government of the Kwara State under Lt. Col. David Bamigboye has been showing very keen interest in Agriculture

in the State.

ALREADY, A NUMBER OF FARM INSTITUTIONS HAS BEEN ESTABLISHED AS DEMONSTRATION CENTRES. THESE FARMS ARE ALREADY AT OFFA, ALAPA, PATEGI, OGRUBA AND OCHAJA

WOMEN ARE ALSO IN THE SHOW. HOUSEWIVES ON THE FARMSTEADS ARE BEING TAUGHT HOME-ECONOMICS TO MAKE THEM MORE USEFUL CITIZENS.

A number of Schools of Agriculture are to be opened to train young farmers.

Such farmers will not just pass out but will be financed on passing out by both the State and their respective Local Authorities.

## HARVESTING IN THE U. S. S. R.

Thousands of combines criss-cross the vast fields of the Kazakh virgin land, harvest-

## POULTRY

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Continue from page 10

## WHICH SYSTEM ?

The mechanised cages used in Europe save a lot of labour but add a lot to the cost and sometimes breakdown.

### E. CAPITAL COSTS

In Europe and other cold climates cages are much cheaper than deep litter because expensive insulated houses are needed to keep the birds warm and a much smaller house is needed to hold the same number of birds in cages than on litter.

The difference in house costs more than pays for the

cages. In West Africa housing is much cheaper, and imported cages are dearer, so that batteries are more expensive in first cost than litter, at least if imported cages are used.

If sufficiently well made to last and suit the birds locally made cages can reduce costs, though badly designed cages are useless however little they cost. Whether imported or good local cages are used the advantages of lower food consumption and better health more than pay for the higher initial cost, compared with deep litter.

# TERRAMYCIN

## POULTRY FORMULAR WITH

### ANTI - GERM 77

**A**LL wonder drugs are not the same. Some are more wonderful than others and among these exceptional drugs is Terramycin Poultry Formula with Anti-Germ 77 which gives double protection to your poultry.

PERHAPS YOU DO NOT ALWAYS REALISE THAT YOU BUY TWO

DISTINCT PRODUCTS WHENEVER YOU PURCHASE TERRAMYCIN POULTRY FORMULA WITH ANTI-GERM 77 EACH OF THESE TWO PRODUCTS IS EQUALLY IMPORTANT IN COMBATING GERMS.

Anti-Germ 77 is a most potent germicide which destroys germs in the drinking water. Its activity is outside the bird's body. On the other hand Terramycin is the most reliable broad spectrum antibiotic for effective combat of disease germs within the bird's body.

Terramycin Poultry Formula with Anti-Germ 77 is therefore the only product which fights disease germs both within and outside the body.

In the modern poultry industry where intensive poultry keeping is now the rule, the importance of preventing the spread of infection can not be over-emphasised. Even in the best managed farms anywhere in the world, infections still break out.

Before one sick bird is discovered, it would have taken

both feed and water, and therefore contaminated them. But whereas the germs may not spread through the feed at an alarming rate, they do spread through the water at a fantastic rate. As many as 50 or more birds may already be infected by the time you isolate one sick bird.

These 50 birds now become new reservoirs of infection and until they show symptoms of infection, you can neither identify nor isolate them. It is therefore of paramount importance to give an outstandingly good medicament to the birds in order to "nip in the bud" any chances of disease outbreak.

The most reliable drug to use under these conditions is the drug which will not only destroy those germs which have already entered the birds body but also those that are in the drinking water and thus prevent any chances of their infecting more birds.

In West Africa, as in most other parts of the World, Terramycin Poultry Formula with Anti-Germ 77 is always the wise poultry man's first choice.

Terramycin Poultry Formula with Anti-Germ 77 is distributed by Pfizer International.

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ON ANY KIND  
OF DRUGS, FOR  
LIVESTOCK  
POULTRY  
FARMING  
AND  
HORTICULTURE  
ETC.  
ARE ACCEPTED  
FREE ON  
THIS PAGE

### CORRECTION PLEASE

In our last issue—Feb. '69 we inadvertently printed a wrong name and address of the Distributors of TYLAN.

The correct name and address are:-

ABULU & COMPANY LTD  
P. M. B. 1077, YABA.

326, Herbert Macaulay St.,  
Yaba. Telephone 4444

# FARM POULTRY MANAGEMENT (2)

*SPACE requirements per bird in a floor housing system are the same for all types of chicks up to 10 weeks. In general chicks less than 2 weeks old need  $\frac{1}{2}$  square foot per bird; chicks from 2 to 10 weeks need 1 square foot per bird; growing pullets from 10 to 20 weeks need  $1\frac{1}{2}$  to 2 $\frac{1}{2}$  square feet per bird.*

*Layers need 2 $\frac{1}{2}$  to 3 or more square feet per bird, the exact square depending on the body size of the bird and the temperature.*

Pullets need about  $\frac{1}{2}$  square foot more space per bird when the temperature is above 80°F. As a general rule, large flocks require less space per bird than small flocks.

Through efficient management and use of automatic equipment, some poultrymen have reduced space allowances per layer without increasing losses.

When space per layer is reduced, the layers should be debeaked. More care is required in operating the house to maintain egg production if space is limited.

Some poultrymen with small flocks make use of porches or yards to provide additional space per bird.

A 12 by 16-foot brooder house will accommodate 200 pullet chicks or 200 straight-run chicks to 8 weeks. A brooding-growing house should be 2 to 3 times larger than a brooding house that holds the same number of birds.

A 36 by 140-foot house will accommodate 2,000 small-breed pullets to laying age, 1,800 pullets and cockerels to maturity, or 5,000 broilers to market age.

A portable range shelter 8 by 9 feet will house 100 birds from the time they go onto the range until they reach maturity.

## BUILDING FEATURES

A poultry house should provide clean, dry, comfortable quarter for birds throughout the year. An interior temperature range of 45 to 80°F. is satisfactory for economy of egg production.

Moisture is a common problem in poultry houses. Fresh air should be circulated, but the house should be free of drafts.

Pole-type houses are economical to build, maintain, and clean. They are becoming increasingly popular for all

THIS SERIES ARE MADE AVAILABLE THROUGH THIS MEDIUM FOR THE NIGERIAN BREEDERS BY COURTESY OF THE U.S.A.I.D.

types of flocks—replacement chicks, growing pullets, layers, breeders, and meat-type birds.

Pressure-treated poles are set into the ground to support the roof and walls of a single-story structure. Pole-type houses often have roofs made

of metal or other water-proofed materials. Walls may be made of poultry netting or conventional building materials.

Other types of poultry buildings include open, open-front, and insulated houses. Prefabricated poultry houses of several types are available.

All poultry buildings—whether new or remodelled—should contain:—

- \* Floors which can be cleaned and disinfected easily.
- \* Walls which can be washed easily.
- \* A ventilation system. Build-in gravity systems, adjustable roof ridge ventilators, and fans are often used.
- \* Fireproof and vermin-proof insulation.
- \* Water piped into the house. The water system should be adequately protected against heat

Continue from page



This new British-built machine should prove a boon to farmers requiring balanced feed. It has been specially designed to eliminate hand weighing or measuring the ingredients before milling.

Powered by a one-horse-power single phase electric motor, the unit is small and compact, measuring only 24 in. by 26 in. by 21 in.; and is easily positioned above the mill in an existing system. It will deal with four separate ingredients fed to it by gravity from overhead storage by augers from ground level.

Four flow switches enable the farmer-user to regulate the amount of each ingredient required in the feed; and a fifth dial controls total volume. Once set, the machine can be left unattended. Should any ingredient run out or become blocked, an automatic switch stops the operation.

Manufacturer: R. A. Lister and Co. Dursley Gloucestershire, England.

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- FISHERY PROJECT



# ANIM

West.

## PROJECTS

A Report on USAID Nigeria Livestock Project Activities At the National USAID Agriculture Workers' Conference Lagos, Nigeria—Jan. 29, 1969.

By E. R. Halbrook,  
Chief Livestock Branch

In the short time assigned to me on this programme I have decided to review the status of our Livestock Project today as compared to a year ago, point out the major changes which have occurred during the interval, and then enumerate our more important accomplishments to-date.

It might be stated as an introduction that, although the size of the livestock industry in Nigeria is only an estimate, based upon numbers which are believed by many to be inaccurate, we can say that the value approaches 130 million pounds and that the greater part of this value is in the Northern states, largely due to the presence of the tsetse fly in the South. The South, therefore, serves as the major consuming market for the livestock of the North—especially of cattle.

There are many who say that the cattle are valued by their producer—owners more for the number of wives they can buy and the prestige conveyed than for their monetary value but this is being over-exaggerated. The nomadic Fulani is being forced to sell his livestock because of decreasing grazing land and the encroachment of crop farming, just as it occurred in the United States in the

We had a year ago two livestock projects called Livestock Development West (767) and Livestock Development—North (774). Last July 1, the project in West was discontinued and Livestock Development North (774) was changed to Livestock Development Nigeria (774).

Since January 1, 1968, had a total of 18 field technicians on board, consisting 13 direct hire, 4 BLM/PASA and 1 KSU contract. Today we have a total of 11 on board, consisting of 5 direct hire, 5 BLM/PASA and 1 USPHS/PASA. Four of the previous livestock project positions have been changed to the Agriculture Extension Project (770).

Major government changes were made last April 1, as all of you know. As a result of these changes, involving the elimination of regions and the formation of states, livestock project programming had to be changed with work prepared by states and agencies.

For example, while we had two project work plans a year ago, we now have several and would have an eight but for our intention to move the only remaining project technician in the state at an early date.

## ASSIGNMENTS

Our 11 livestock project

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GERMICIDE AND INSECTICIDES.

## REPORT OF

HUSBANDRY  
IN NIGERIA

old technicians on board  
present are assigned as  
follows:

1. One (1) in poultry production to the Livestock and Meat Authority.
2. Two (2) in animal husbandry and range management instruction to the Livestock Assistant Training Centre at Mando Road under the Interim Common Services Agency.
3. Two (2) to the Federal Department of Veterinary Research at Vom in vaccine production and disease diagnosis.
4. One (1) in range management to serve both the North-Western and the North-Central States.
5. One (1) serving the North-Eastern State in range management and cattle breeding.

6. Two (2) stationed in Jos—one to assist the Benue-Plateau and North-Eastern States in range management and one to give these and other states assistance in range management equipment servicing and repair.
7. One (1) BLM/PASA chief of party works the Northern States and gives help to other range management technicians.
8. Finally, we have one livestock advisor completing his assignment in the Western State

after which it is expected that he will be assigned to the Livestock and Meat Authority.

9. The four livestock project technicians who have been transferred to the Extension Project (770) are stationed at Fashola in beef cattle and swine work with one temporarily stationed in Kaduna attached to the Extension-Research Liaison Section (ERLS) of Ahmadu Bello University as Livestock Extension Advisor.

The fourth is at present in Lagos and is to be moved to the North as soon as housing can be arranged. He will work in poultry extension.

That is a very brief summary of our present livestock project activities and the changes brought about during the year.

## ACCOMPLISHMENTS

What has AID Livestock Project assistance accomplished?

In the former Western Region we have helped—

1. To develop a poultry programme which has eliminated the necessity of importing eggs and has placed quality eggs in most areas, including the Lagos market.
2. To establish an abattoir and two pilot meat markets which are pro-

viding an outlet for Western State beef and pork formerly hard to sell. The two small pilot meat markets are doing a volume of business approaching £50,000 a year.

3. To demonstrate that imported dairy breeds will survive and produce and reproduce normally, even though at present competition with imported dairy products would make a viable dairy industry doubtful.
4. To show that imported swine breeds can be maintained in Nigeria and will reproduce normally. The market outlet is still a major limiting factor as well as the available supply of maize for swine feeding.
5. To establish a successful programme of artificial insemination with dairy cows and give assistance to some 55 producers in forming or assisting five co-operative groups to engage in beef cattle production.

In the North, AID has assisted in—

1. The establishment of poultry breeding/hatching units at Jos and Kaduna which should be able when in full scale operation to supply most of the chicks needed to start a poultry extension programme. A third unit is yet to be developed at Ilorin.
2. Making a start in beef cattle breeding through establishment of the Bornu Ranch in the North-Eastern State and previous assistance to Livestock Investigational Breeding Centres (LIBCs). (It should be pointed out, however, that cattle breeding is a long-time project and thus hardly fits into a standard AID programme.

3. Establishing a pilot cattle fattening ranch at Manchok and developing it to a limited operational basis. Results to-date would seem to point to a marketing problem not previously fully appreciated; namely, lack of interest on the part of Northern consumers in buying finished beef at a higher price than ordinary meat.

4. On the other hand the abattoir/meat market complex established in Kaduna will no doubt serve a valuable pilot function under the operation of the livestock and Meat Authority.

5. The Livestock Services Training Centre at Kaduna is enrolling 25 to 30 students a year and a range management curriculum was added two years ago with the first six students graduating last summer.

6. The range management pilot projects have been especially valuable in selling range land conservation and the need of adequate livestock water supply to Northern State government officials if their industry is to survive. We have recently heard from every state in the North on this subject except one.

7. Finally, our assistance to the Federal Department of Veterinary Research at Vom is helping to make more dependable vaccines available throughout Nigeria.

I would like to close by leaving with you the question—How can these accomplishments be measured in shillings and pence so they can be rated on the AID/W computers?



IN the two previous instalments, effort was made to essay out the menace, life span, habits and breeding grounds of flies and their species. This last instalment will treat the control of the various stages and offer helpful hints for the control of the ubiquitous fly.

- \* Be sure your garbage can have a tight-fitting lid and no holes. Wrap garbage in paper bag or newspaper (unless contrary to local regulations). Wash inside of can regularly.
- \* For composting: use a fly-tight box or cover each new layer of material with a layer of dirt.

**FIGHT  
FLIES  
WITH  
INSECTICIDES**

- \* Do not stack lawn clippings: allow clippings to remain on lawn, spade into the ground, or scatter thinly in garden.

**CONTROL LARVAE AND PUPAE**

- \* If an effort has been made to eliminate fly sources but larvae and pupae are still found, such chemicals as Malathion, DDT or fuel oil may be used.
- \* Many chemicals will kill fly larvae but there are numerous difficulties

involved in using them effectively. Failure usually results from lack of thorough mixing of the larvicide with the infested material.

- \* Care must be exercised in selecting a larvicide as some chemicals make manure unfit for use on crops. Best results will be obtained by following the directions on the label.
- \* If you use animal manure to fertilize your garden, examine it to make sure it does not contain fly larvae and pupae. If it is infested, destroy the flies by spreading the manure in a thin layer and drench-spraying with an insecticide.

Other materials containing fly larvae can be treated in the same way.

**CONTROL THE ADULTS**

If most of the flies have been eliminated as eggs, larvae, or pupae, the remain-

This applies especially to baits which may taste attractive to young children.

- \* If adult flies are not too numerous they can be controlled successfully with sprays applied to vegetation, walls, and other surfaces where flies rest. Malathion, Diazinon, and DDT are widely used in this way.
- \* Various poison baits are effective in controlling adult flies. Malathion, Diazinon, and Diptorex are available in granular form in large shaker containers. Liquid baits containing these insecticides are also available.
- \* As an emergency measure it may be desirable to attempt to control large numbers of flies in outdoor areas with insecticidal space sprays. Your local chemist or patent medicine dealer will help you to select a good one. Flit guns or aerosol bombs may be useful indoors and in enclosed areas outdoors.

- \* Keep flies out of your home by screening doors and windows.
- \* Electrocutation devices can help control small fly populations.

- \* Electrical insecticide vaporizers containing lindane can kill flies in an enclosed room but their use is not recommended in homes, or in other buildings in rooms where food is or people work or sleep.

- \* Fly traps baited with meat, fish or sweets are usually not effective in controlling flies. They attract more flies to your premises and if neglected, provide a breeding place for more flies.

- \* Fly paper and fly swatters are still of limited usefulness in controlling adult flies.

**THE**

**FLY (3)**

**PROBLEM**

*by Our Sanitary Correspondent*

ing adults may then be controlled by use of one or more of the standard insecticides according to the directions on the label.

In some areas flies have developed resistance to some chemicals. This must be considered in selecting an insecticide.

All insecticides should be handled with care. They are all poisonous to humans in some degree. Insecticides should not be spread about or stored where children can get into them.

# RATS

- THEY ARE YOUR WORST ENEMY
- GET RID OF THEM

cent, the rat population of a given area seems to replace itself within about a year

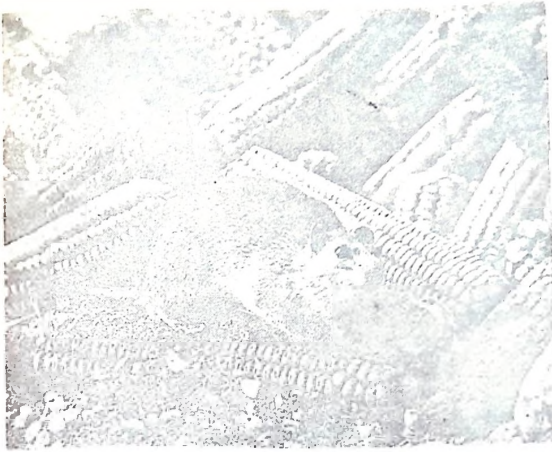
**COMPULSIVE GNAWING**

The rat is driven by his teeth. His chisel-bladed incisors, which appear eight or ten days after birth, begin to grow immediately at a rate of five inches a year.

They must be continually filed down by chewing: if an upper tooth is lost or knocked out of line, the bottom one opposite the gap may grow through the upper jaw and pierce the brain.

Rats have created pocket blackouts by gnawing through the lead sheathing of electric

Continue on page 20



**EXCEPT FOR MAN HIMSELF, THE RAT IS PROBABLY AT ONCE THE CLEVEREST, MOST DESTRUCTIVE AND ADAPTABLE ANIMAL ON THE EARTH. FROM NEAR THE FROZEN ARCTIC TO THE BLAZING DESERT, THIS ANIMAL, WITH ITS REMARKABLE INSTINCT FOR SURVIVAL, HAS NOT ONLY SURVIVED MAN BUT AT TIMES THREATENED HIM WITH EXTINCTION—RATBORNE DISEASES MAY HAVE KILLED MORE PEOPLE THAN ALL THE WARS IN HISTORY.**

Of some 550 kinds of rat, most live in forests, fields and jungles far from civilization. But aeons ago, a few species made a historic decision: to link their destinies with that of man. They went where man went, ate what he ate, learned his ways.

Rats are social animals and live in colonies. In laboratory experiments, if a strange adult male is placed in a pen containing a colony he will be attacked. But this is not a fight in the human sense. A colony rat arches his back and leaps, moving his forelimbs and often nipping at the invader's ears and tail. The stranger never retaliates, and the bites are not effective because of the rat's thick skin.

After a few such "bouts," each lasting only a few seconds, the invader is often left stretched out limply, breathing rapidly and irregularly.

Anytime from 90 minutes to a few days after these seemingly futile attacks, the invader usually dies. No organic cause, no serious wound or internal bleeding has yet been discovered to explain the death.

Although a caged rat could live to a doddering old age of three years, wild rats ordinarily live only about nine months, hardly ever more than two years. They can breed any month of the year. The number of babies in a litter is generally five to ten, but litters as high as 17 have been recorded.

Given ideal conditions, one pair of rats breeding only three litters a year could theoretically produce at least 20 million descendants in three years.

Exterminators have used every poison known; yet even with kill rates of 95 per

## TRAPPING WITH HUMANE HAVAHART TRAPS THE WORLD'S FINEST TRAP FOR FARM HOME AND INDUSTRIES

*You can catch anything from a mouse to a fox, alive and unhurt.*

*With these traps it is now possible for the farmer or suburbanite to eliminate pests from his property without harming pets or valuable animals.*

*An animal may be molesting the poultry, may be destroying food in the provision stores, in the house or kitchen, in the farm, in the granaries etc.; some would prefer to use poison, the steel trap, or the killer type for taking animals, the average problem occurs where there are the other valuable animals, or little children around, which may fall victims, one or more HAVAHART TRAP is the answer. Join the thousands who agree that the HAVAHART TRAP is the most unique animal trap in the market today. Poultrymen, farmers, estate owners are using these traps successfully for years.*

*An outstanding advantage of Havahart traps is that they capture without injury whatever they catch, (it may be your neighbour's cat) the animal can simply be transported to a place where they can do no harm, and you do not have to kill them unless this is desirable.*

*With these traps you can rid your property pests without harming children, pets or valuable animal. NO SPRING TO BREAK OR GET OUT OF ORDER, entirely galvanised, rust resistant, can't harm pets or children, completely humane, simple to operate, lasts a lifetime. Portable.*

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 LAGOS.

*A series on the various diseases hampering successful pig breeding. These series prepared by the U.S. Department of Agriculture is issued for the benefit of Nigerian breeders by the courtesy of the U. S. A. I. D., Nigeria.*



# PIGS :

**P**ROTOZOA are the simplest forms of animal life, the individual consisting of an exceedingly minute, speck of living matter. Some forms of free living, others are parasitic. The parasitic forms can be seen only with the aid of a microscope.

In spite of their small size they can inflict serious damage. They are responsible for some of the severest diseases that afflict human beings, for example, malaria, amoebic dysentery, and Africa sleeping sickness.

Protozoa of livestock and poultry cause important diseases such as tick fever and genital trichomoniasis of cattle, dourine and related diseases of horse, coccidiosis of poultry and livestock, and blackhead of poultry.

## DYSENTERY-PRODUCING PROTOZOA

Swine harbour in their intestine a number of Protozoa including forms that are closely related to, if not identical with, those found in human beings. Some, known as amoeba, are practically indistinguishable from those known to produce amoebic

dysentery in man.

Others, known as balantidia, are apparently identical with forms that produce dysentery in human beings.

The dysentery-producing Protozoa are conveyed from animal to animal by minute rounded bodies known as cysts which are the resistant stage in the life cycle of the parasite.

The cysts are discharged with the droppings. Pigs swallow them while eating or drinking.

It has not been determined to what extent amoebae injure swine. There is evidence that balantidia can be injurious, especially in the case of swine fed principally on corn or garbage. The possibility that these organisms can be transmitted to human beings become unthrifty, and emaciated. In extreme cases which may result in death loss of flesh is pronounced.

These symptoms are associated with a marked destruction of intestinal cells and a swelling and congestion of the intestinal wall. should be kept in mind.

If for no other reason, measures designed to control these parasites in swine are indicated as a human-health safeguard. Measures for the control of coccidiosis may be used.

## COCCIDIA

Coccidia attack the lining of the intestines. The damage they do causes scouring and other ill effects which are known as coccidiosis. About six types of coccidia have been noticed among pigs.

The infective stages are known as oocysts. The largest ones are about one five-hundredth of an inch in diameter. They are discharged with the droppings. Before the oocysts can infect pigs, they must develop in the open.

## LIFE HISTORY

Pigs swallow the oocysts with feed and water that have become contaminated with the droppings of infected swine. On reaching the intestine, the contents of the oocyst, consisting of several infective bodies, are liberated.

Each infective body is capable of penetrating and damaging a cell of the intes-

tinal lining. It develops at the expense of the cell and produces a number of new infective bodies. Each of the newly formed infective bodies is capable of entering a neighbouring cell and repeating the process of development, multiplication, and cell destruction.

The multiplication of coccidia does not continue indefinitely however; if but few oocysts are swallowed by a pig the few cells that are destroyed by the developing coccidia may not produce serious injury.

Sooner or later in the development of coccidia oocysts are formed. Discharged with the droppings, they propagate the infection.

Swine which recover from coccidiosis may continue to discharge oocysts for a long time. Such pigs are classed as carriers; they transmit coccidiosis to susceptible pigs.

## DAMAGE

In light cases no symptoms are observed. In market infections pigs may scour,

# THEIR INTERNAL PARASITES (1)

become unthrifty an, emaciated. In extreme cases which may result in death lost of flesh is pronounced.

These symptoms are associated with a marked destruction of intestinal cells and a swelling and congestion of the intestinal wall.

## TREATMENT

Consult your local or state Veterinary Officer timely on noticing any symptom of disease. The disease will be quickly checked.

## CONTROL

The control of coccidiosis is largely a matter of sanitation. Severe cases usually occur under crowded unsanitary conditions, particularly in pigs raised on old hog lots and on permanent low and wet pastures, which are ideal for the survival of the oocysts.

Infected pigs that were removed from unsanitary surroundings to clean pastures or isolated in houses with concrete floors have shown marked improvement. Removal of an infected pig from the area where the infection was acquired reduces the chances of reinfection and affords opportunity for recovery.

## TRICHOMONADS

Another type of Protozoa, known as trichomonads, occurs in the intestine, stomach, and sometimes in

the nose of swine. These parasites are pear-shaped and extremely tiny. They move by means of whiplike structures attached to one end of the body.

It is not known how trichomonads are conveyed from one pig to another. However, pigs kept under unsanitary conditions generally harbour greater numbers of these parasites than do clean pigs.

Under ordinary conditions trichomonads in the stomach and intestine are not known to be serious. In severe infections they may cause scouring. Trichomonads in the nose are often associated with atrophic rhinitis. These parasites have not been shown to be the sole cause of this disease, however.

Trichomonads from the nose and intestinal tract of swine can live in the reproductive tract of cattle. In cows they cause abortions and other breeding difficulties.

## TREATMENT

Consult the nearest Veterinarian Officer.

## CONTROL

Measures for the control of coccidia are applicable to the control of trichomonads. In addition, cattle and swine should not be kept together if infection of cattle with trichomonads of swine is to be avoided.

Continue from page 7

## HYBRID

bers have introduced intermediate birds which are half way towards this ideal.

The Ross Rocket from Sterling Poultry is now being marketed. Weighing less than four pounds (1.8 kg) it is as prolific as heavier birds and eats considerably less food. Livability is high.

The Thornber 808 is the newest bird to be marketed in the UK. It is claimed to weigh around 3.5 pounds (1.6 kg) yet it lays 260 eggs a year under commercial conditions. It rises to a peak production of 80 per cent. with a feed consumption of only 3.5 ounces (99 gms) of feed a day.

By reducing the body weight of these birds—both Leghorn types—the whole economic conditions within a unit change. More birds can be kept in the same space; and they eat considerably less food because of their lower body weight.

## MODERNISED BASE

All the British companies are competing strongly in international markets and are setting up agencies through-

out the world. And the performance of their birds is highly competitive.

The 60 million sales of chicks each year in the UK give British companies a compact and highly modernised base for maintaining their breeding programmes. This is necessary if a first class chick is to be produced.

The effect of the move into the international field, coupled with expanding sales means that the base and experience under all conditions become more valuable. The opportunities for improving performance in the future are therefore enhanced.

## Inquiries to:

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*Sterling Poultry Products Ltd., Ross House, Grimsby, Lincolnshire.*

*Double A. Hatcheries, Brockworth, Witcombe, Gloucestershire.*

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**POULTRY MANAGEMENT**

\* Electricity, for artificial lights to provide a uniform light "day" in the poultry house, and to operate equipment, as needed.

Auxiliary rooms—such as those for egg, feed, or equipment storage—should be centrally located.

Incinerators or disposal pits are essential on all poultry farms, as a disease-control measure.

Incinerators or disposal pits should be placed where they are convenient. A disposal pit 4 feet square and 6 feet deep is adequate for a flock with 1,000 layers or 10,000 broilers.

It should be constructed above the water table, at least 100 feet from the water supply, with drainage in the opposite direction. The cover should be tight fitting. Local public health officials should be consulted in installing a disposal pit.

**EQUIPMENT**

Select equipment that is safe for the birds, convenient to use, and easy to keep clean. Whenever possible, equipment should be installed in a way that allows removal when the house is cleaned.

Use of automatic or semi-automatic equipment saves hours of labour. Mechanical feeders, waterers, and—occasionally—pit cleaners are used for farm-sized flocks.

Feed and litter carriers that operate on tracks are adapted to use in long houses. Bulk feed requires special storage bins.

**BROODER HOUSE EQUIPMENT**

**Brooders**

To give day-old chicks a proper start, the brooder must provide a temperature of about 95°F. in winter and 90 the rest of the year.

# WEED CONTROL

## BY AGRONOMIST

**WEEDS** growing in orchards do serve some useful purposes. They supply organic matter to the soil and often prevent erosion following heavy rain.

During the spring and summer months, however, weeds compete with fruit trees for available soil moisture and nutrients. Their control at this time is a must. Furthermore, rank weed growth around the butts of fruit trees increases the problem of controlling insects pests.

### Weed Control and Soil Management

Bare soil conditions during the summer are desirable except where ample irrigation facilities are available. The two alternative systems—clean cultivation or close mowing—are designed to reduce transpiration losses of moisture.

Under both systems weeds growing around tree trunks are out of reach of cultivators or rotary mowers.

In many orchards it has become standard practice to treat these small areas with herbicides.

In orchard lands between trees, weeds usually reappear toward the end of summer. Although chemical control is possible, it is rarely undertaken because of the additional cost.

### Spraying Useful

Chemical weed control is useful in the following situations:—

- \* For the control of per-

ennial grasses, particularly around tree trunks.

- \* For seasonal weeds where cultivation would lead to dusty conditions, or interfere with irrigation equipment or tree props.
- \* For the control of weeds close to the trunks of trees following spring cultivation. Cultivation then need be done to surface feeder roots. In addition, control of many insect pests would be facilitated.

- \* Where weeds grow on steep hill slopes, cultivation is desirable only in one direction. Herbicides could then be used for these narrow strips missed along the tree rows.

### Apply Chemicals Carefully

Herbicides are normally applied at spraying pressures of from 50 to 100 psi. The usual volume applied is 100 to 150 gallons per acre. Where absorption is taking place through the leaf, sufficient solution should be applied only to wet the leaf.

Normal orchard spraying equipment can be used to apply the herbicides mentioned, but some care is required to avoid contamination. Although in no way as dangerous as hormone-like herbicides, all spray equipment including the tank and hoses should be washed out after use.

Spray solution should not be allowed to come in contact with tree foliage; for this reason spraying should not be undertaken in windy weather.

Double spray nozzles attached to a lance are most satisfactory.

In a cultivated orchard the area to be treated around each tree will depend on the degree to which the implement is offset and upon the spreading habit of the tree.

The effectiveness of a herbicide depends on the ability of the operator to apply material at the recommended rate per

acre of treated area. Therefore the orchardist should know the quantity of spray mixture to be applied around each tree.

A circle six feet in diameter around each tree is usually sprayed. This means that 10 gallons of the spray solution shown in the table is sufficient to treat 80 to 90 trees, or that one pint of the spray mixture is required for each tree.

By spraying into a graduated bucket the actual time taken to apply one pint can be measured. This will indicate the time that should be spent at each tree.

In order to kill all the weed seeds as they germinate, it is essential to obtain an even

application of the spray to the soil surface. Heavy plant growth or other trash lying on the surface will reduce the effectiveness of the treatment.

Young plants are more

readily killed than large established plants so a lower rate of application is required for treatments applied at this time.

The herbicide, however, must have a more lasting effect to cope with weeds which can emerge over a period of several months.

### Risk of Damage

Recommended treatments should not be applied to fruit trees less than three years old.

### Effect of Soil Type

Where fruit trees are growing in sandy soils, risk is increased. In these soils rain or irrigation water may wash herbicides through the soil into root area and cause damage. Under these conditions, consult your agricultural agent or officer for necessary advice.

For the attention of:

**DISTRIBUTORS OF VETERINARY PREPARATIONS**

Opportunity for Agency for Quality Veterinary Preparations. Very attractive conditions for suitable Distributors.

Write: Advert 10, P. O. Box 79, EB.

Continue from page 18

### POULTRY MANAGEMENT

Some types of brooders heat the entire room or house. Other types warm the area under or near the hover, while the rest of the room remains relatively cool. Chicks feather better when they have a cool place to exercise.

Chicks need enough space under the brooder so that they can keep warm without crowding, piling up, or smothering. Under normal conditions, each replacement chick needs about 6 or 7 square inches of brooder space.

Manufacturers often overrate the capacity of their brooders. For example, a 96 inch hover—rated as a 1,000-chick brooder—will satisfactorily brood 600 replacement or 850 broiler chicks under cold conditions.

Brooders may be operated by hot water or hot air. The fuel may be electricity, oil, gas, or coal.

In selecting brooders, consider the fuels available in your locality and the amount of heat needed during the seasons in which you intend to brood.

Choose brooders that can be raised and lowered easily, are easy to clean, have reliable thermostats, and are equipped with thermometers.

Electric and gas brooders require minimum care.

In cold weather, electric brooders should be used only in well-insulated houses. If a house is not insulated, these brooders may not give off enough heat during the winter to keep chicks warm and the litter dry. Auxiliary heat may be needed during the winter with electric brooders.

Gas and oil-burning brooders vary widely in heat output. In cold weather, wet litter may be a special problem with gas brooders that do

not have flues for venting combustion gases to the outside.

Coal-burning brooders require more labour than other systems, because they must be refuelled and cleaned frequently. They keep the entire house warm and the litter relatively dry.

Fires in poultry houses often start from leaky oil brooders. Coal brooders also may be fire hazards if not properly operated. An asbestos sheet, or other fire-resistant material, may be placed under brooders to minimize the danger from fires.

#### Lights :

A 7½ or 15-watt light under the hover will attract young chicks to heat. Attraction lights are not normally used after the first 2 weeks of brooding.

Continue from page 15

### RATS

Rats carry as many as 35 different diseases. Their fleas spread bubonic plague, which killed at least one out of every three people in Europe in the fourteenth century and is still endemic in the Far East and Africa.

Everywhere he goes, the rat spreads contamination. He is a health menace as deadly as a nuclear warhead. Rats carry as many as 35 different diseases. Their fleas spread bubonic plague, which killed at least one out of every three people in Europe in the fourteenth century and is still endemic in the Far East and Africa.

Pest officials at all British ports keep a close watch for plague rats. No plague-infested rat has been found at London docks since 1926. "But without constant vigilance," warns Arthur Marshall, the Port of London's chief health inspector, "there could easily be disaster."

#### Feeders :

Hanging tube-type feeders are rapidly replacing trough-type feeders, because there is less labour and there is less bruising of chicks with the hanging feeders.

Allow three hanging feeders—each 15 inches in diameter with a 25-pound capacity—per 100 chicks.

If trough feeders are available, they may be used for farm flock. Allow two 4-foot tough feed hoppers, open on both sides, or 200 linear inches of hopper space for each 100 chicks at 3 weeks of age.

When chicks are 7 weeks old, provide three 4-foot feed hoppers, or 300 linear inches, per 100 birds. Provide additional feeders when the temperature is above 80° F.

If automatic feeders are

used, follow the manufacturer's directions carefully.

#### Waterers:

Use two 1-gallon water fountains for each 100 chicks during the first 2 weeks. Allow 40 linear inches of water trough per 100 birds at 3 weeks, and 50 linear inches from the time the birds are 7 weeks old until the end of brooding. Provide additional waterers when the temperature is above 80° F.

Waterers should be automatic or float-controlled. Hanging waterers are preferable to the stationary type.

Follow the manufacturer's recommendations concerning space allowances for automatic water systems.

#### Other equipment:

Roosts and perches should be provided in the brooding house if roosts are to be used in the laying house.

The fleas of the Norway rat also carry typhus. Epidemic for four centuries, this disease has killed at least 200 million people. But plague and typhus are

not all. The rat's foraging habits take him from sewer to warehouse to home tracking disease germs every step of the way.

His habit of urinating and leaving droppings where ever he goes provides him with an enormous capability and range for contamination, for in his blood and intestines are organisms that cause amoebic dysentery, tularemia, salmonellosis, jaundice, rabies and other killer diseases.

#### GREED

The rat's voracious appetite and his droppings deprive humanity of huge quantities of food—and countries that can least afford it suffer most.

Hundreds of years ago, attempts were made to bring rats under control. To preserve grain, an Act passed in the reign of Elizabeth I fixed a reward of a penny for three rat heads.

Today, aided by modern poisons—as well as natural predators such as weasels, stoats, kestrels and snakes—local authorities and pest-extermination firms continue the war.

But unfortunately for us, nature has endowed the rat with a special characteristic which aids greatly in his survival.

On his own hunting grounds, anything new such as poison bait is instinctively avoided. After the strange food has been ignored for a while, however, it becomes familiar, and the rat samples it in minute amounts.

If it is poisoned, the ill effects of a small dose may be noted without lethal consequence. Whereupon the

rat stops feeding completely and may sprinkle the food with his urine or faeces to warn other members of the pack.

One poison which outwits this keen suspicion is warfarin, which acts slowly. A rat eats warfarin which over a few days, mounts up in his body and produces internal haemorrhage. This kills him. But even warfarin, used with success since 1950, is not infallible.

For about eight years, scientists have been puzzled by the appearance, due to a genetic change, of warfarin-resistant rats in the United Kingdom. Ministry of Agriculture scientists and pest-control companies are still searching for an answer.

### WILY WAYS

There is probably no animal more cunning. A pest expert who spent a night in a grocery shop watched a rat gnaw through a rope from which hams were suspended, while his friends waited eagerly below for the feast to ender.

A magistrate, on holidays tells of spending a night on what was a seemingly lifeless coral atoll in the Tobriand Islands. He was kept awake most of the night by rats crawling over him. Next morning, he scouted the area trying to find what it was on that barren island that could support such a large rat colony. He saw no sign of fruit, nuts, insects or other food.

"Then," said the magistrate, "I noticed some rats going down to the edge of the reef—lank, hungry-looking brutes with pink, naked tails. There, at the edge of the coral, rat after rat dangled his tail in the water.

Suddenly, one rat gave a violent leap of about a yard and, as he landed, I saw a crab clinging to his tail. Turning round, the rat grabbed the crab and devoured it, then returned to his perch. Meanwhile, other rats were repeating the same performance."

When a Farm is infested with rats, a good control programme becomes a "must." The work involved is just as essential as any other farm chore.

You can cut down rat population by poisoning, trapping, gassing, blocking, flooding, or any number of ways. But don't expect any one method to do the whole job. Poisoning, for example, may kill most of the rodents, but a few will survive. Trapping or gassing may then be necessary for complete control.

Remember, too, that you may kill off all the rats, but other may come if you don't eliminate their eating and nesting places.

### Poisoning

Use the anti-coagulant poisons (warfarin, fumarin, pivalyl, etc.) for good control and less danger to pets and children.

You can also prepare baits from chopped lean meat, sausage, fish liver, bacon, eggs, apple, tomato, peanut butter, melon rind, sweet potato, banana, cheese, cereals, sweet corn, fresh blood, milk, and strawberry jam.

When using fresh baits you usually have to make daily replacements.

Place the baits in runways, near burrows, or wherever rats are feeding and living.

For permanent control use bait stations made of boxes, baskets, or boards with openings just large enough for the rodents to enter. The stations should be large enough to hold dry bait and poisoned water; they should be fastened down and baffled inside.

Stations protect the baits from pets, other farm animals, and children, and give rats a secured place to feed. Placed properly, feeding stations will also attract the rodents and can be kept supplied with fresh baits at all times.

Do not allow the baits to become old and mouldy. Use plenty of bait. It will take from 8 to 10 pounds of material for the average infestation and it takes from 7 to 10 feedings by rats to kill them.

**CAUTION:** (Label poison containers and keep them out of reach of children, pets, and other farm animals. Destroy dead rats.)

### TRAPPING

Use traps along with poison bait or to get the rats that have survived poisoning. Use a wood base snap trap and enlarge its bait pan or trigger with cardboard or wire mesh.

Place the traps in dark corners, runways, and near burrows, or even tack them to move the dead rats. Fix with some of the fresh baits mentioned earlier.

### GASSING

Control of rats with poisonous gas included gassing of burrows and fumigation of buildings. The latter should be done only by experienced operators.

Gassing of rat burrows out-of-doors is an excellent means of control. It is safe to use in the open when reasonable precautions are taken to avoid breathing the fumes or dust.

It is easily blown into rat burrows with a foot pump or garden duster. The gas kills rats quickly.

Most of the rats as well as their parasites die in the ground, and there is no secondary hazard to pets and other animals.

Carbon bisulphide and carbon monoxide gases have also been used successfully.

### DESTROYING BURROWS

When rat burrows are numerous in fields or poultry pens, the first efforts at control should be by methods already described. Then the area should be plowed to a depth of 18 inches with a subsoiler or "chisel" to des-

troy most of the rat holes.

With fewer safety retreats, it will then be easier to keep down the number of rats.

Tunnels in yards or about buildings can be collapsed by use of a pick, crowbar, or shovel.

### FLOODING

The rodents may sometimes be killed by flooding their burrows. Rats tunnel, however, are shorter than those of most field rodents, and the animals may escape the water. Results, therefore, are not always satisfactory.

### BLOCKING

In some places it is possible to close all rat entrances to a building and then kill most or all of the rats inside. This practice is called blocking. A careful preliminary search is made and all but the one or two entrances in most active use are blocked securely with sheets of tin, large rocks, or stout boxes filled with soil.

On the night selected for blocking, the remaining entrances are quietly barricaded about an hour after dark. Then two or more persons, equipped with strong flashlights, enter and kill the rats with clubs.

### POISONOUS DUST

In situations where there is no hazard of contaminating human food or feedstuffs for domestic animals, a poisonous dust may be spread where rats run.

Some of the dust adheres to their hair and feet and is licked off and swallowed; soon the rodents die. Once placed, the dust should not be stirred up; kernels of small grains on a dusted area must not be swept up and fed to livestock.

Sodium flosulfate (Na<sub>2</sub>SIF<sub>6</sub>) is the most effective dust to use.

The material is placed in a narrow strip close to walls,

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# LAUGH

!!!  
 "Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

IT WAS a Friday afternoon, and one of our friends gave little thought to having his motor mower borrowed by a neighbour until he happened to mention it to another neighbour whose mower had also been borrowed. Later, he was even more surprised to learn that three more mowers had been loaned to the same man.

When the hoarder was pressed for an explanation, he assured the men that all mowers would be returned bright and early on Monday morning. "This is one week-end," he added with a grin, "that I intend to sleep late—in peace."

WE WERE driving through a sleepy little village one evening, when our headlights picked out the figure of a woman—running for all she was worth down the road. Close behind her followed a man who appeared to be gaining at every step.

We screeched to a halt and, leaping out, I asked the woman, "Can we be of any assistance?"

"Oh, no, thanks," she panted. "My husband and I always race home like this from the cinema. Last one in does the supper dishes."

ONE DAY my husband came home proudly displaying a handsome bonus cheque from his company. It was a complete surprise to both of us, and my first comment was, "Let's put it in our savings account and pretend we didn't get it."

"That would be fine," he replied, "if we didn't been pretending we'd already had it."

LEAVING for a week's visit to her sister, my wife handed me a gallon of paint and a four-inch brush. "Darling," she said, "in case you feel like painting the town as soon as I've gone, how about

starting with the kitching?"

RADIO Free Europe tells of a nightclub behind the Iron Curtain which had been established by the communists to encourage tourism. The club failed, and its manager was hauled before the party leader for an explanation. "Perhaps the party leader suggested the finest products," said the manager.

"No, we hired the best chefs in town to prepare meals from the finest products," said the manager.

"What about the drinks, then?"

"The drinks were the finest," said the manager. "We searched out the best wine cellars and even imported the best whisky."

"Then, what about the girls?"

"Ah, they were the least of our worries," said the manager. "They have all been good party members since 1920"

ON THE day of the champion football match, thousands of vehicles inched towards the stadium. Police waved the cars in, parking attendants squeezed them into narrow spaces. By the time game was under way, officials congratulating one another on how they had handled the traffic.

Then they heard someone cry. It was a woman sobbing at the wheel of a parked car, with frightened children in the back seat. They asked her what was wrong. "All we were trying to do was sobbed the mother, " was go to shop for some bread."

MY YOUNG brother was skimming a neighbour's child in house for the first time, and I heard him announce proudly as he passed the cocktail cabinet: "Aha! This is my father's chemistry set."

## AGENTS WANTED

Intelligent and reliable persons wanted all over the Federation to sell on good commission and terms:

## FARMSTOCK

Farmers, & Stockbreeders monthly.

Applications to:-

CIRCULATION MANAGER,  
 FARMSTOCK  
 P. O. BOX 79,  
 EBUTE-METTA.

Continued from page 21

## RATS

then boards may be leaned over the dust and against the wall to make a rodent corridor and prevent the dust from being scattered. Dust also may be put on overhead beams and pipes.

You don't have to put up with rats. These pests spread many animal and human diseases; they eat, waste, and contaminate incredible quantities of foodstuffs; they ruin property; and they maim and kill young livestock and doultry.

If your farm is infested with rats, now is the time to get rid of them.

## YOUR V. I. P.

To everyone in business there is a V. I. P. finding him is always a problem.

To you the seller your V. I. P. is your BUYER. How does he find you?

A variety of rederr and BUYERS for that matter are attracted to our CLASSIFIED ADVERTISEMENT culum

From among them a particular one will be looking for the very thing you are offering.

That one is your VIP See page 18 for Rates Advertisements should reach us two months before the month of publication

## CLASSIFIED

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### SEEDS

Vegetable seeds just arrived from Europe Low Price Free Encouraging Samples Available for housing and social ORGANISATIONS. NORTHERN NIGERIAN TECHNICAL SERVICE LIMITED, 59, Tafawa Balewa Road P. O. Box 11 KANO, phone 3687.

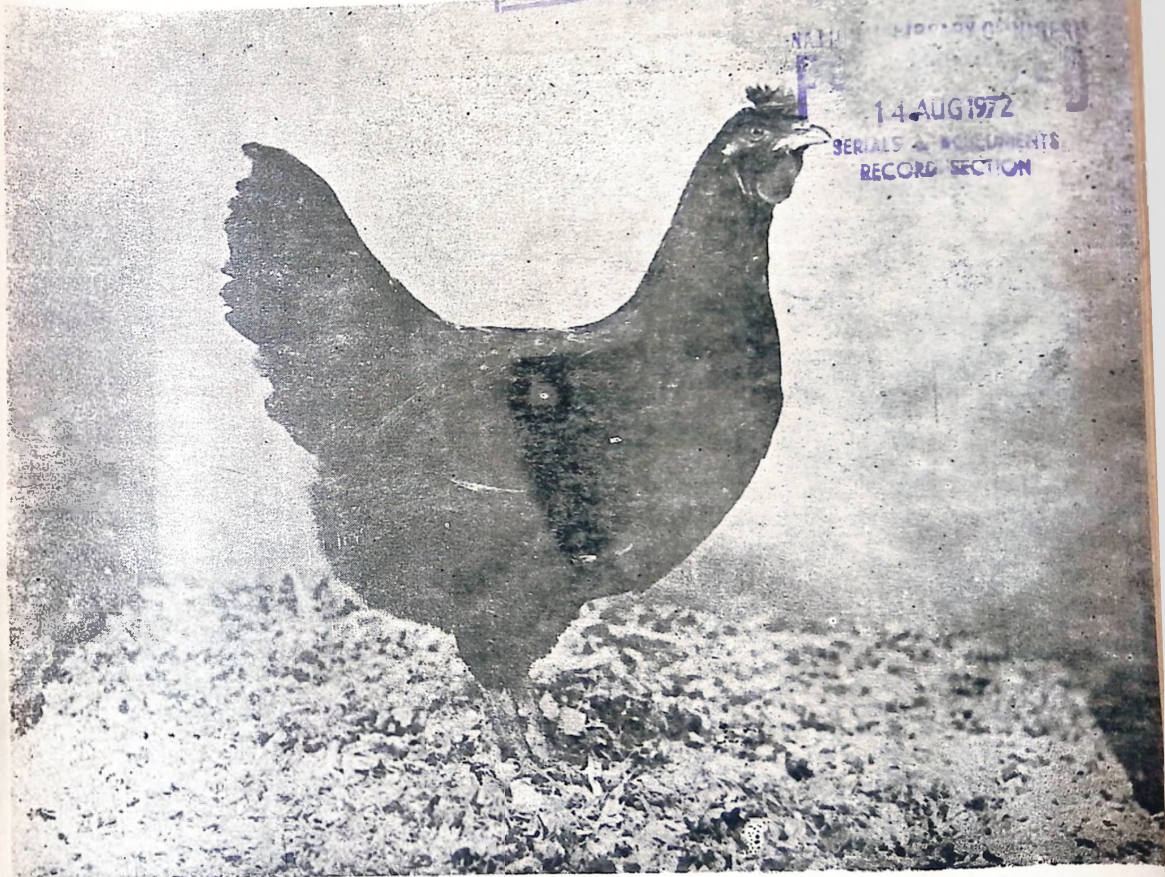
### WOODEN BATTERY CAGES

We build wooden Cages holding 105 chicks in very little space. M. Jimoh, 3/4 Akodu Street, Mushin.

# FARMSTOCK

STOCKBREEDERS' & FARMERS' MONTHLY  
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● HORTICULTURE ● FARMING & ● FOODSTUFFS ETC.

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## NEW BRITISH BROWN-EGGER

Conbroody, food conversion excellent, low mortality.....see p 5

JULY '69

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Price: One shilling

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## CONTENTS

**CROP SPRAYER FOR FOUR WHEEL DRIVE TRACTOR HAS HIGH VOLUME**

**M**OST types of liquids, including wettable powders, can be handled by a new high-volume crop sprayer developed by a British firm.

Designed specifically for a new British four-wheel drive tractor, the sprayer uses a diaphragm-type pump unit, powered by the tractor power take off, having an output of 14.3 gal./min. (65 litre/min.) at 500 rev./min., giving an application rate of up to 90 gal./acre (1022 litre/hectare).

The sprayer has a mild steel galvanised 210 gal. (955 litre) capacity tank carried on the tractor's rear platform. It is supplied with 33 ft. (10m) wide booms, designed to fit the front or rear of the tractor, which fold within the tractor's width for transport.

The sprayer pump can also be used as a high pressure washer by simply adding an attachment. In addition, a hand lance is available for high pressure spraying. Maximum output is 426.7 lb/ft<sup>2</sup> (30 kg/cm<sup>2</sup>).

The sprayer is supplied as standard with a 25 gal./min. (114 litre/min) self-filling injector-type attachment complete with weighted strainer. Controls are located in the tractor cab and comprise a synchromatic unit which gives finger-tip control for pressure regulation, boom selection for single or double sided work, and suction filling. A pressure gauge is built into the control unit.

Incorporated in the nozzle holders are special spring-loaded anti-drip units which prevent dripping when the main control is switched to the 'off' position. The pressure in the line is relieved and the extra spray is returned to the tank.

With the front mounted booms, the operator has a clear view of the spraying width. If the tractor hits an obstacle, the booms swing back and then return to the spraying position.

(E. Allman and Co. Ltd., Birdham Road, Chichester, Sussex, England; tractor is the Forward Control 1004 County made by County Commercial Cars Ltd., Fleet, Hampshire, England).

**AUTOMATIC ENVIRONMENTAL CONTROL FOR LIVESTOCK HOUSING**

**C**OMPLETELY automatic control of heating, lighting and ventilation in livestock housing of up to 45 ft. by 400 ft. (13.7m to 122m) in size is claimed by the manufacturer of a new solid-state control panel.

The panel can control up to twenty-six 18-in. (457-mm) or twenty 24-in. (609-mm)

application. It has a capacity of 72 ft<sup>3</sup> (2.04 m<sup>3</sup>) with an effective spreading width of 32 ft (9.8 m).

The hopper is divided into two parts, the forward part being tipped hydraulically by the tractor driver to keep the rear end replenished.

The rear portion meters the fertiliser on to a rotating disc, which has three adjustable vanes each of which can be set in four positions for uniform spreading. The rate of spreading is set on an adjusting scale which has seven positions each with four sub-divisions.

Side extension convert the distributor into a grain trailer with a capacity of 140 ft<sup>3</sup> (4 m<sup>3</sup>) to hold approximately 3 tons. A grain gate, capable of emptying the full load by gravity into a hopper in 50 seconds, can be fitted.

A grain auger can be substituted for the grain gate so that controlled unloading can take place into transport trailers and trucks. This enables the grain version to be used as the main transport for combine harvesting, either to receive direct from the combine and unload into bins at the buildings, or to be the main receiver from the combines in the field, filling the trucks as they arrive.

Where big seed drills are employed or multi-drilling operations are in progress, the unit could be used to speed and simplify seed hopper filling in the field.

The distributor is 11 ft. 2 in. (3.4 m) long and 5 ft. 4 in. (1.63 m) wide. Total weight with the spreader mechanism is 1279 lb. (580 kg).

Hopper width is 5 ft. 1 in. (1.55 m) and the length 7 ft 10 in. (2.4 m). Auger discharge height is 8 ft. 6 in. (2.6 m). Application rate is 112 to 1120 lb./acre (127 to 1270 kg/hectare).

International Harvester Co. of Great Britain, 259 City Road, London.

**New Equipment**

**ULTRA-LIGHTWEIGHT BALL AND ROLLER UNITS EASE PALLETISED LOADS**

Claimed to be an advance in the handling of pallets in air freighters, vehicles, and freight containers, a new ultra-lightweight system of ball and roller units has been developed by a British firm.

Apart from the manoeuvrability of the pallets, the system results in a high-capacity/low-weight ratio, which has been achieved by encasing the ball units in a patented acetal copolymer housing fitted with a high precision machined-steel ball seating. Units weighing 5½ oz. (145 g.) have a load capacity of 150 lb. (68 kg.) and 4¼ oz. (121 g.) rollers can support 300 lb. (136 kg.) per roller.

The firm says that the seatings are more efficient than pressings hitherto employed and enable one operator to push a two-ton load and two men to push loads up to 10,000 lb. (4536 kg).

The ball and roller units are free from corrosion, resistant to most acids and alkalis, can easily be stripped for maintenance, and have a long working life. They can easily be fitted to and removed from any type of general purpose vehicle.

fans to within any limit between 10 per cent and maximum. The control is interlocked to a blow-air heating system giving accurate environmental control, normally using one sensing probe to each section of the house.

Light dimming in the range 1500 W to 12000 W can be either manual or automatic. Over-riding thermostats for double-ended houses eliminate over-heating of one section if the temperature falls sharply at the other end.

There is also an electronic heater switch interlock for blow-air heating controlled by the same sensing device as the fans. This ensures that the heater cannot be switched on while the fans are running fast. A heater balance device controls the ventilation-heat ratio.

(Maywick Appliances Limited, Wickford, Essex, England; Maywick-Holloway panel Model HL.V. Price dependent on range of control desired.)

**FERTILIZER DISTRIBUTOR HAS ALL-SEASONS APPLICATION**

**A** NEW power driven bulk fertiliser distributor made by a British firm can be converted easily into a grain transporting trailer with either auger or gatetype unloading, thus providing a versatile tool with all-seasons

## MONTHLY ADVISORY SERIES

**N**OW THAT THE RAINY SEASON IS AGAIN ON POULTRY FARMERS SHOULD BE THINKING OF THE PROBLEMS THEY HAD WITH THEIR BIRDS LAST RAINY SEASON, AND OF HOW TO AVOID THEM THIS TIME. DISEASE IS A PARTICULAR PROBLEM FOR THOSE WHO KEEP THEIR BIRDS N LITTER, WHETHER AS BROILERS OR FOR EGG PRODUCTION.

## PRINCIPAL DISEASES

There are three principal diseases which can come from wet litter, *Aspergillus*, *Coccidiosis*, and *Worms*. The last two are complicated subjects and to discuss them would need at least one article each. So in this article I want to start by discussing *Aspergillus*, which is quite a simple disease to understand and to prevent, but which causes considerable losses in young chicks every year.

BRITISH POULTRY  
SHOWN AT ITALIAN  
AGRIC FAIR

Cover picture shows the H7, a laying bird that was shown by its breeders at the International Agriculture and Animal Farming Fair being held at Verong recently. It reaches 4.3 lb. (1.95kg) at 20 weeks and produces a brown egg.

The strain is said to be conbroody and to have a low mortality rate. It is also said to lay better at the end of the cycle than most brown eggers.

The breeders also showed another laying bird, the H3, which reaches 4.05 lb (1.815 kg) at 20 weeks and lays tinted eggs, and the Pihoh, a broiler, that reaches 4.5 lb (2.04 kg) in 65 days.

All three strains of poultry will thrive in most climates and already the birds are being bred in fifty different countries.

It is a disease which is quite easy to prevent, but impossible to cure, so now is the time to take action against it. *Aspergillus* is a fungus, or mould disease, which can only infect very young chickens. The *Aspergillus* fungus normally lives on all kinds of things which have nothing to do with chickens, such as in the soil and on decaying plants.

by  
**L. J. Elmslie M. A. (Cantab)**

*Specialising in Agriculture*

*Technical Director, Ejinaka & Thornber Ltd.*

Some are found in almost all lots of sawdust and wood-shavings, especially during the rainy season. If the shavings or sawdust are even a little bit wet the fungus grows on the small pieces of wood, and also produces 'spores' which are the fungus equivalent of seeds, and float in the air mostly near the ground.

Both the fungus itself and its spores are too small to identify without a microscope but because it is almost certain that the fungus is present in even slightly damp shavings there is no real need to identify it.

*Aspergillus* causes disease



**SEASON (1)**

confirmed that the disease is *Aspergillus* there is no use in the farmer rushing to spend money on medicines which will not cure it.

## SUSCEPTIBILITY

Continue on page 10

## PREPARING

**FOR  
THE  
RAIN**

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**DRESSED CHICKENS**

The largest farm

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when chicks breathe in spores which have come from fungus in the litter. The spore lands inside the bird's lungs and starts to grow. The bird's breathing is hindered, and after sometime it may stop growing, become thin, and perhaps die.

Not all the birds in an affected flock die. Five to ten percent would be an average figure, but for every bird which dies there will be two or three which have suffered the disease and will not do well in the rest of their lives because of the damage it has done.

There is no cure. If it is

**ADVERTISEMENT**

# TERRAMYCIN EGG FORMULA

Terramycin Egg Formula is the most potent antibiotic possessing the broad-spectrum Terramycin activity together with added Vitamins. These Vitamins are A, B<sub>2</sub>, D<sub>3</sub>, E, K, Riboflavin, Niacinamide, and Pantothenic acid.

Each of these Vitamins does specific and complementary work in the birds body to improve its health and to stimulate it to lay at least one extra egg a week throughout its laying cycle.

**WHAT THESE VITAMINS DO FOR THE BIRDS:**

**VITAMIN A:** Essential for normal egg production, fertility and hatchability in breeders. Strengthens the body and skin, and reinforces the bird's resistance against diseases. Increased mortality, susceptibility to diseases, general weakness, and drop in egg production are deficiency symptoms.

**VITAMIN D<sub>3</sub>:** Indispensable for proper Calcium and phosphorus metabolism, and hence bone and muscle development; promotes egg production and sound egg shell formation. Deficiency causes bone malformation, muscular weakness and paralysis.

**VITAMIN E:** Necessary for the normal functioning of the reproduction organs. It improves fertility and embryonic development (breeders). Deficiency causes poor egg production and reduces hatchability (breeders).

**VITAMIN K:** Prevents haemorrhagic diseases while deficiency result in failure of blood to clot.

**VITAMIN B<sub>12</sub>** Promotes growth and reproduction. Stress should always be guarded against because it often triggers off disease outbreaks the causative

**RIBOFLAVIN:** Essential for high egg production, for development and health maintenance, and improved hatchability (breeders) reduced egg production, reduced vitality and 'curled' toes paralysis are deficiency symptoms.

**NIACINAMIDE:** Promotes growth and maintains health. Prevents perosis in birds.  
**PANTOTHENIC ACID:** Essential for healthy nerves and growth.

**BENEFITS OF USING TERRAMYCIN EGG FORMULA**

**1. REDUCES MORTALITY:** The Vitamins mentioned above prevent nutritional diseases while the Terramycin suppresses most diseases causing organisms in the bird's body. One valuable pullet saved justifies the cost of buying one bottle of Terramycin Egg Formula.

**2. OVERCOMES POINT OF LAY STRESS:** At point of lay several physiological changes take place within the pullet to transform it into an "egg factory" capable of producing some 20 dozen eggs in a year. This change normally imposes a stress on the birds and mortality can be high. With judicious use of Terramycin Egg Formula these losses are averted.

**3. INCREASES EGG PRODUCTION BY UP TO 37%:**

The birds come into lay earlier, reach a peak production earlier and sustain production peak longer.

**4. SUPPRESSES STRESSES:** Prevents laying slumps during stress periods. organisms like like Viruses. Bacteria, Protozoa are present in latent form. Common stress factors are;

I Extremes in weather; too hot cold, wet or dry. Heavy, and violent storms also upset birds.

II Deworming; even the mildest acting worm drugs imposes a stress on the bird's system.

III Changes in feed or feeding methods are stress inducing factors. Any change such as from Mash to Pellets or vice versa must be gradual and not sudden to minimise the stress.

IV Vaccination; innoculation against - Newcastle Disease, Bronchitis etc. often aggravate C.R.D, especially where live virus has been used.

V Mass handling or movement also precipitates stress in birds.

VI Overcrowding; Insufficient feed troughs or waterers; and starvation are other factors which cause stress condition.

5. PROTECTION: Offers excellent protection against a large range of disease causing organisms like bacteria, certain protozoa and larger viruses.

6. EGG SHELL QUALITY: Improves egg shell strength because it contains adequate quantity of Vitamin D essential for Calcium metabolism in birds. Since calcium is the mineral composing egg shell, such abnormalities like:

Shell-less eggs  
Thin and soft shells, disappear.

7. REDUCES FEED COST: Terramycin Egg Formula greatly increases feed efficiency. With the same quantity of feed as was fed before, the birds lay extra larger eggs. The cost of

producing each dozen eggs is therefore reduced while profit margin is increased. The conversion of feed to eggs is increased by up to 18%.

8. FERTILITY FACTOR: Increased fertility, increased egg production while the proportion of fertile eggs in the breeding flock is accordingly increased.

9. HATCHABILITY INCREASES: Promotes hatchability in the breeder,

by suppressing embryonic mortality. Chick livability increases because the hatched chicks are healthier and more fortified to withstand the strains of the first few days after hatching.

**WHEN AND HOW TO USE:**

1. CONTINUOUSLY: Use continuously round the clock every day of the year if highest profits are to be made.

Dosage:- 1 Level teaspoonful to 8 gallons of water.

2. MASS HANDLING OPERATIONS: Debeaking, innoculation are operations requiring handling of all birds. Start to use Terramycin Egg Formula 3 days before the Operation and continue for 2 weeks after.

Dosage:- 1 Level teaspoonful to 1 & 1/2 gallons of water

3. DISEASE PRESENCE: When there is a mild outbreak of disease in the area Terramycin Egg Formula should be used to maintain high egg production.

Dosage:- Use 1 Level teaspoonful to 1 & 1/2 gallons of

Continue on page 10

## LETTERS

## DIARY OF AGRIC

Dear Sir,  
**T**HE BRAINS BEHIND FARMSTOCK DESERVE SOME BIG PAT ON THEIR SHOULDERS FOR THE GOOD SERVICE THE MEDIUM PROVIDES, BUT A LITTLE MORE CAN STILL BE DONE.

Personally, I think the price of sixpence is too small if the paper is not to be short-lived. Any paper of the standard of FARMSTOCK cannot sell for less than a shilling.

Truly, the sales of copies cannot offset the cost of production; but if a paper is too cheap, some may thereby slight it. Besides, improvements may be too expensive.

Please consider the publication of a monthly DIARY

of agricultural events all over the country; this will help farmers and buyers as well. People on leave will know where to go for what.

Thanks for space allowed.  
 Isa Musadiq.  
 Jos.  
 Editor's Note.

*I cannot agree with you less on all your points. Incidentally, the Farmstock is now a shilling after selling at 6d a copy for a whole year.*

## EVENTS

## MARKETING SERVICE

Dear Sir,  
 In some previous issues of FARMSTOCK requests were made for a feature on the prices of farm products at their various centres of origin.

Since then nothing has been done to serve eager readers on this important aspect.

Ibadan Jubrila Hassan

Editor's Note:

It is a pity that arrangements are not complete, but we shall soon start.

Dear Sir,  
 For some like me farming is at the moment an impossibility. I have but only a small space. It may permanently be so for some time. But I want to do some business that I can nurse myself and turn to farming in future when I have more money.

I do not like poultry as I do not eat fowls myself. Can you make some suggestions?

Akure Wale George  
 Editor's Note:

I am sure you will enjoy keeping rabbits. With a little capital and small space, you can make money easily. And the meat? Sweet and tender; you will definitely like it. The skin is marketed. You are interested write for more particulars to FARMSTOCK (Rabbits) P. O. Box 79, EB.

\*\*\*\*\*  
**BLOOD TEST**

To ensure that birds attain and maintain their highest standard of performance either for the table, as layers or breeders, tests and typing of blood are regularly carried out.

In this picture, a laboratory technician collects blood from a chicken.

The extracted blood is then certified as of the quality and quantity required before being injected into another bird to produce antibodies.

In this manner, British birds are able to command a high grade in comparative value against foreign breeds.



# NEWS..... STARTS

## TRACTOR HIRING UNIT OPERATION

THE TRACTOR HIRING UNIT OF THE AGRICULTURAL DIVISION OF THE NORTH WESTERN STATE MINISTRY OF NATURAL RESOURCES HAS STARTED OPERATIONS IN VARIOUS AGRICULTURAL DIVISIONS OF SOKOTO PROVINCE.

Disclosing this in his Office there recently the Agricultural Superintendent in charge of the Unit, Malam S. U. Dama said that the Unit offers services of tractors and other machineries for use by individuals after a payment of

a fixed fee. Malam Dama gave the following charges per acre of different types of land as the fee for the use of the machineries:-

**Upland Areas**  
Ploughing 25/- per acre

Disc Horrowing 21/- " "  
Ridging 21/- " "  
Ridge Splitting 32/- " "

**Black Cotton Soil**  
Ploughing 40/- " "  
Cultivating 32/6d " "  
Ridging 32/6d " "

**Fadama Soils**  
Ploughing 80/- " "  
Disc Cultivation 39/- " "

He further disclosed that if more than one operation

was carried out then the charge would be:-  
Ploughing and ridging on upland 40/- per acre

Fadama Tine Cultivation in both directions 60/- per acre

The Agricultural Superintendent explained that the Province has been divided into divisions and in each Division there is a team leader whose duty it is to supply the Headquarters with the weekly return of the operations.

## TOBACCO DEAL: STATE FROWNS

The Government of the North Western State has severely criticised the method by which the Nigeria Tobacco Company (N. T. C.) buys tobacco from farmers in this State through a clique called the 'master farmers'.

In a strongly worded statement issued here recently the government described the method as tendentious and one which savours of bribery, corruption and brutal exploitation of tobacco farmers, and has thus called on the

Company to remedy the situation immediately.

Giving details of the 'deplorable system' as currently operated, the government explained that the Nigerian Tobacco Company refuses to have anything to do with the tobacco farmers directly.

Rather, a handful of these farmers, named by the N. T. C. as 'master farmers', are contracted as the 'go betweens'. These master farmers constitute just a fraction of the total number of tobacco farmers in the state: in a

particular area, there are only 70 out of 6,000 farmers'.

The statement pointed out that as the ordinary tobacco farmers has no other avenue by which to market his produce other than the N. T. C. through the so-called 'master farmers', he is compelled to sell to this N. T. C. accredited agent - at times at give away prices. What is more, investigations have revealed that many of these so-called master farmers are in fact, not farmers at all, but Nigeria Tobacco Company's financed agents who dictate the policy of production and distribution. Some of the master farmers are even known to have bought tobacco from hard-pressed farmers months before the produce was ripe and ready.

Investigation have also revealed that some farmers pay anything between £1 or £3 as bribe on a bundle of tobacco to the agents in order that their ware could be accepted. Any farmer who refuses to yield to this corrupt practice runs the risk of getting his tobacco rejected.

For this reason, all farmers

have had to subject themselves to this gruesome racket which, in effect, reduces them to the status of mere labourers in their own farms.

The government has also called on the Federal Military Government to help in finding market for Nigerian tobacco in any part of the world in order to make it possible for tobacco farmers to grow beyond the present restricted level dictated by the Nigerian Tobacco Company.

Currently, the total output of the crop in the State is dictated by the N. T. C., thus farmers always run the risk of giving away 'surplus' products or burning them.

The North Western State is one of the major suppliers of tobacco in this country. In 1965, a total of 9.4 million (lbs) pounds of tobacco was marketed in the State as compared to a total figure of 11.5 million for the whole Northern States. Last year the State produced 5.47 million lbs and this figure could easily be trebled if the market could be found.

Meanwhile, the State Ministry of Natural Resources and Co-operatives is e

Continue on page 10

### DIZENGOFF W. A. (NIG.) LTD.

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Chicks, Broilers, Breeders, Layers & Swine.

ALL KINDS OF VETERINARY PRODUCTS  
GERMICIDE AND INSECTICIDES.

# HOW TO IDENTIFY PARASITES

**T**he presence of parasites on the farm constitutes one of the major problems any livestock breeder has to combat to ensure healthy profitable products. In this instalment, external parasites of poultry are discussed. A careful study of the symptoms mentioned will help in spotting these harmful insects that may reduce or even ruin your otherwise profitable business. In our next and last instalment, the control of these parasites will be fully discussed.

To control the parasites effectively you will have to identify the kind that is causing trouble, for the type of control method differs for different parasites.

To check further, look for the mites around the vent or along the sides of the breast on the skin and feathers. Damage by the fowl

**Note:** Other mites, not connected with poultry, may live in the roosts and housing, feeding on debris or poultry mash. These mites do not affect your poultry production, so make sure before you treat for the common poultry mite. In doubt, ask your faru advisor.

damaging the bird directly by mites, sucking blood chicken ticks transmit the agent of fowl *spirochaetosis* in flocks where this disease has been introduced.

## CHICKEN BODY LOUSE

The chicken body louse, *Menacanthus stramineus*, is the commonest of the several kinds of chewing lice found on poultry. Lice spend their entire lives on the skin or feathers of the birds, attaching their eggs to the feathers.

Poultry lice do not suck blood but feed on skin scales and feathers, and their presence in considerable numbers produces skin irritation and scabbing.

Young chickens are quickly and severely affected, and become droopy and ruffled. Diarrhea and death frequently follow.

The controls are the same for all kinds, although some are harder to control than others. You can recognize lice as wingless forms, with three pairs of legs, and their body divided into three sections—head, thorax, and abdomen—although sometimes only two are obvious.

Lice are also characterized as if pressure had been applied from above.

## STICK TIGHT FLEA

The sticktight flea, *Echthidophaga gallinacea*, is one of the two main types of fleas also found on poultry, particularly in warm dry areas. The sticktight flea is small and dark brown, usually remains attached to the skin of poultry, often around the eyes.

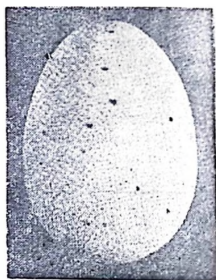
It also survives on dogs, cats, rodents, and other hosts. The eggs drop to the ground and hatch.

The tiny worm-like larvae live on organic debris on the ground, nesting boxes, or similar sites.

## CHICKEN TICK

The chicken tick ("blue

CORRESPONDENT



BY A SPECIAL

## FOWL MITE

The fowl mite, *ornithonyssus sylviarum*, is suspected if you see small reddish or dark specks move across the surface of newly laid eggs.

## POULTRY

DAY OLD CHICKS,  
LAYERS & BROILERS.

INCUBATORS,  
BROODERS  
METAL CAGES  
& HOUSES  
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HAMMERMILLS  
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P. O. Box 206 Tel. 452.

mite includes production of anemia. The birds have a droopy weakened appearance, with pale comb and wattles. Heavy infestations may result in death.

The fowl mite is a blood-sucker which usually spends its entire life on the bird.

## POULTRY MITE

The common poultry mite, *Dermansyssus gallinae*, also is a bloodsucker but attacks the bird only at night to feed, and spends the day in crevices in the roosts or housing. Like the fowl mite you may spot this mite crawling on newly laid eggs.

To identify it further look for masses of mites in cracks of the housing near the roost where the common poultry mite can survive for months without feeding.

It causes the same symp-

toms on birds as the fowl-mite—*anemia*, droopy appearance, pale comb and wattles. bug"), *Argas persicus*, is large enough to be identified by observation, but they often are hidden. Its first stage, or seed tick, has three pairs of legs and is much smaller than the adult. Seed ticks remain attached to fowl three to 10 days sucking blood; then they drop off and hide in nearby cracks. The adult tick is up to  $\frac{1}{4}$ " long, has a flattened, oval-shaped body, and four pairs of legs.

Once it drops off the bird it remains hidden and attacks birds only at night; you can find chicken ticks by removing loose boards or scraping out the contents of cracks in the housing near the roosting area.

Symptoms—such as anemia—are similar to those caused by mites. In addition to

Continue on page 20

**TERRAMYCIN** CONTINUED FROM PAGE 6

water until disease danger subsides.

**4. DEFICIENCY DISEASES:** Paralysis, loss of vitality, increased mortality, and nervous incoordination are symptoms of Vitamin deficiency.

**Dosage:-** Use 1 Level teaspoonful to 1 & 1/2 gallons of water for 2 weeks and continue at 1 teaspoonful to 8 gallons of water.

**5. ENDS OF LAYING CIRCLE:** Obtain high production at this time when egg size is biggest.

**Dosage:-** 1 teaspoonful to 1 & 1/2 gallons of water for the last four weeks of the laying circle.

**EARLIER AND EARLIER PEAKING:** Dosage- 1 Level teaspoonful to 1/2 gallons of water for the first four weeks and continue at 1 teaspoonful to 8 gallons of water after this.

**PROFITABILITY OF TERRAMYCIN EGGS**

**1. REDUCED MORTALITY:** Even in the best of forms mortality at the point of lay is a regular occurrence. But by using Terramycin Egg Formular, this mortality is greatly reduced. During this time, Terramycin Egg Formula saves between 5 and 10% of the birds. The figure could be higher if optimum management condition does not exist. The value of 5 hybrid pullets as potential sources of 20 or more dozen eggs each should not be overlooked.

Each bird gives direct profit of at least £1 (culling value plus eggs less expenses). An average farmer who might have lost 10 pullets out of his flock of 100 birds has already saved £10, while the best farmer has gained £5, because they have prevented mortality by using Terramycin Egg formula.

**2. EXTRA EGGS:** Highest profits are only realised when Terramycin Egg Formular is used continuously through the bird's laying circle. Profits from these eggs can be easily calculated.

**COST:**

Dosage of 1 teaspoonful to 1 & 1/2 gallons of water is used at:

1 Point of lay for the first 4 weeks.

2 End of lay for the last 4 weeks.

∴ 1 Level teaspoonful per 1 & 1/2 gallons of water is used for 8 weeks or 56 4 days.

Generally, in 1 day, 100 layers drink 8 gallons of water ∴ in 1 day 1 layer drinks  $\frac{8}{100}$

∴ in 56 days 1 layer drinks  $\frac{8 \times 56}{100}$

= 4 & 1/2 gallons.

Number of teaspoonful required =  $4 \frac{1}{2}$  divided by  $1 \frac{1}{2}$  = 3.

In the remaining 310 days, 1 layer drinks  $8 \times 310 = 24.8$  gallons.

∴ Number of teaspoonfuls required =  $24.8$  divided by 8 (continuous dosage is 1 teaspoonful to 8 gallons) = 3.

Total number of teaspoonfuls required per bird per year =  $3$  plus  $3 = 6$

but 1 teaspoonful cost approximately 1/-

6 teaspoonfuls cost „ 6/-

**RETURNS:** During the laying circle, the farmer will get at least one extra big egg per week. Most farmers even do better than this.

Returns from 52 eggs at 4/- per dozen =  $17/4d = -$

Profit from eggs per bird =  $17/4d - 6/- = 11/4d.$

Taking profit per bird as 11/-, profit from 100 layers is £55.

£55 is what the farmer who has 100 layers is losing because he is not using Terramycin Egg Formula. For the greatest pessimist, 5/- per bird is more than possible. It is an accepted reality. Even here a substantial extra profit of £25 is in his pocket, £25 to £50- extraprofit is for any poultry farmer who chooses the best feeds (manufactured by Livestock Feeds Limited) and Terramycin Egg Formular for his birds. It can be yours if you start using Terramycin

Egg Formular today. And practically Terramycin Egg Formula.

i Is very easy to use.

ii Is readily soluble in water.

iii Does not corrode your water founts or troughs, or block automatic waterers.

iv Stores well under cool dry condition.

v Is available in handy packages of 1/4 lb. unbreakable plastic containers.

vi Is very cheap, just 1/- per teaspoonful.

**MANAGEMENT HINTS:** Best results from the use of Terramycin Egg Formula are only realised when management is excellent. Particular attention should be paid to the provision of feed and fresh clean water ad lib to ensure profit maximisation.

It is an expensive mistake to regard Terramycin Egg Formula as a substitute for good quality feeds (as those prepared by Livestock Feeds Limited) and drinking water.

Continued from page 5

**RAINY SEASON**

*Fortunately only chicks less than 4 weeks of age are susceptible to Aspergillus. If birds can pass that age without infection they will not get it afterwards. Really, the bird grows more resistant as it gets older even up to 4 weeks and most of the danger is in the first 7-10 days.*

Then the disease develops in the bird for a little while before it shows. If disease is suspected the farmer should always seek Veterinary advice. However Aspergillus is a disease which can usually be recognised by the farmer himself quite easily if he has seen it before. (Even if he can recognise it, it is still best to consult a Veterinary adviser in case of complications.)

Apart from the appearance of the sick chicks he will find typical white roundish spots on one or both of the lungs

in birds which die. An unusual variation is the eye form of the disease. The fungus grows into a soft white lump under the eyelid. If the lump is removed carefully the chick may recover quite well.

Since only very young chicks are affected, prevention by keeping them out of contact with damp litter is quite easy. There are various precautions such as the following:-

1. Rearing chicks in cages or verandahs, so that they do not come in contact with litter. This is also good for preventing other diseases, and has other advantages too.

Pullets to be reared for laying can be kept right up to point of lay in brooder/rearing cages, and broilers can be kept up to 3 1/2 lb. liveweight in wire floored units. (Broilers kept over that age on wire develop breast blisters.)

Moving birds from cages or verandahs to deep litter after they have passed the age of susceptibility to Aspergillus is not a good idea because of the increased risk of candidiosis.

2. Litter houses with earth floors are worse for Aspergillus than those with concrete floors, as moisture comes up from the earth in the rainy season. Concrete floors are best laid on top of a waterproof course of plastic sheet to prevent rising damp.

This is particularly important in places where the ground is often wet.

3. Shavings or other litter should be collected dry and stored in a dry place.

# Poultry Management (3)

## GROWING HOUSE EQUIPMENT

**F**EEDERS, waterers, and electric lights are standard equipment for growing houses. Requirements for feeders and waterers are the same as those for brooding houses.

If roosts are to be used in the laying house, they should be provided for pullets in the growing house.

### RANGE EQUIPMENT

On range, provide three 6-foot feeders open on both sides for each 100 birds, or 4 inches of feeder space per bird. To supply water on range, use one 8-gallon gravity-flow waterer, or 8 linear feet of a trough-type waterer, or a fountain with an equivalent capacity for each 100 birds.

Feed hoppers and waterers for range should be close to the shelter. Range equipment may include a protective canopy or sunshade. Many range shelters have no interior equipment. Some have one feed trough and one fountain inside the shelter for use in bad weather.

Roosts and nests should be installed in range shelters before pullets begin to lay. Place roosts at floor level.

### LAYING HOUSE EQUIPMENT

#### Nests

Well-designed nests can reduce the time needed to care for the laying flock and the eggs. Nests may be metal or wood; they may have roll-away floors with egg trays, or other arrangements for convenience in collecting eggs. The interiors should be dark.

Nests may be laced in the middle or along the wall

inside of the building. They sometimes are arranged in a double deck.

Community nests accommodate several layers at one time. Allow one nest 2 feet wide by 6 feet long, with an entrance 8 inches square, for each 50 hens; or provide 1 square foot of nesting space for each four hens.

Individual nests are just large enough to hold one hen. In figuring flock needs, provide one individual nest for each four birds. Usually, an individual nest is 10 to 12 inches wide, 12 to 14 inches high, and about 12 inches deep.

A perch below the entrance will help keep the nest clean.

#### Roosts

Roosts should always be used for growing pullets that are later to be maintained as layers in houses with roosts.

Roosts should be made of 2-inch stock, with rounded or beveled upper edges. Leghorns and other small breeds require 8 inches of roost space per bird; large breeds require about 10 inches of space per bird.

Place roosts 13 to 15 inches apart. Normally, roosts are placed above droppings pits.

Perches, if used, should be built on a slant from the floor.

The back of the perches should be 24 inches from the floor with 1-inch mesh wire beneath them. Beveled 1-by-1-inch material makes a satisfactory perch.

Multiple-deck roosts sometimes are over droppings pits for use with flocks of more than 1,000 birds. Housing needs are reduced by  $\frac{1}{2}$  square foot of floor space per bird

with multiple-deck roosts.

#### Droppings Pits

A droppings pit is designed to hold droppings for several months. For ease in handling, the floor over the pit may be made into 6-by-6-foot panels.

There is a real saving in labour from the use of pits. However, pits harbour rats and are a breeding place for flies.

Feeders and waterers often are placed over pits.

#### Feeders

Allow six hanging feeders—each 15 inches in diameter with a 35-to 50-pound capacity—per 100 medium-weight layers. If hanging feeders are not available, provide at least 40 feet of feeder space (four 5-foot trough feeders with both sides open, or the equivalent) for each 100 laying hens.

Automatic feeders vary widely in capacity. Consult the manufacturer's literature or a specialist before installing such equipment.

All feeders should be placed within 10 feet of a waterer.

Hoppers are needed for insoluble grit and calcium supplements, if these are not included in the feed. For each 100 hens, provide a 12-inch granite grit hopper box and a 12-inch hopper for oystershell or limestone grit.

#### Waterers

Provide and 8-foot automatic hanging waterer, open on both sides, or an equivalent 16 feet of watering space, for each 200 pullets in the laying house. Increase watering space 25 percent when temperatures go above 80°F.

If watering devices are

placed on roosts over droppings pits, the amount of wet litter in the laying house will be minimized.

Water systems may be automatically controlled, or they may flow continuously. Adequate drainage should be provided.

Water requirements vary with the type of water and the season. An automatic system uses 6 to 8 gallons of water daily for each 100 layers.

A reserve water supply is helpful in disease outbreaks or times of disaster. One or more clean oil drums can be used for water storage.

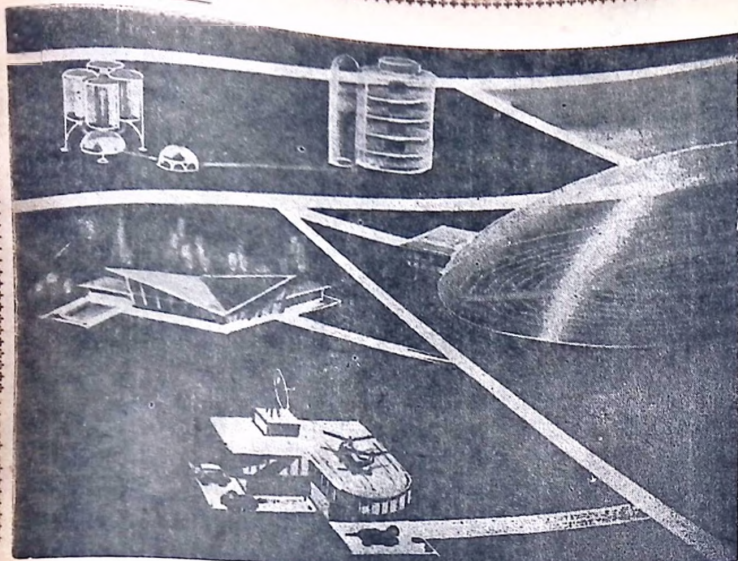
#### Lights

Before installing light fixtures, be sure that the electrical wiring is adequate and that it meets all safety and local code requirements. If you need assistance, contact your local power company.

Automatic switches to control lights are inexpensive and easy to install. An automatic time clock may be set to turn lights on and off at desired times. Automatic dimming devices are recommended when evening lights are used.

Allow one ceiling light for each 200 square feet of floor space. Adjust lights to illuminate the entire floor and roosting areas.

For daytime, morning, or evening lighting, use 60-watt incandescent light bulbs. Shallow-dome (aluminum pie-plate) reflectors or bulbs with built-in reflectors improve the distribution of light within the poultry house.



"TYPICAL" FARM OF YEAR 2000—This might well be what the "typical" farm will look like in the next 30 years. In centre background is warehouse complex and refinery; where barn waste is purified and recirculated back to barn. At right is huge plastic dome covering 10 acres (four hectares) or more and under which crops are grown with computer-controlled environment for maximum production. To left of dome is farmhouse and in front of it the control centre.

## WHAT will farming be like in the year 2000?

Will agriculture be capable of feeding a world population that in all probability will total 7,000 million, or double what it is today?

Will farming techniques of today be obsolete?

These were some of the questions that prompted the Ford Motor Company's tractor and implement operations division in Birmingham, Michigan, to make a two-year survey.

Ford, one of the world's largest tractor manufacturers, recently released an illustrated report, "Agriculture 2000."

The report can be summarized in a single sentence extracted from the conclusions of Ford engineers and other technical personnel, as well as two Michigan State University professors who consulted specialists from many countries.

"The efficient farmer of the year 2000 will be a superbreed of farmer, with super skills and super tools."

Tractors that run without operators—milk from carrot tops and pea pods—cows with 1,000 offspring—glass or plastic domes covering acres of cropland—corn plants resembling small pine trees—farming of the seas—phenomenal crop yields—algae as food for man—vast refineries extracting rich proteins from oils.

These are just a few of the possibilities that are likely to become commonplace on farms in various parts of the world by the turn of the new century.

## DEVELOPMENTS

The year 2000 will see many other unusual agricultural developments:

Some farmers will use electronic-eye machines that shoot seeds into the soil by pneumatic injection. The seeds will be coated with chemicals which will keep them dormant until the proper time for them to start the growth process.

Machines equipped with electronic devices and computerized fingers will decide when a crop is ripe for harvesting. Then the machines will pick, sort and package the crop right in the field.

Machines will harvest one crop and simultaneously plant another. Airborne equipment—a combination hovercraft-helicopter—will be used for spraying.

Orbiting space satellites will supply reports on crop

# SUPER F THE

== 20  
THEY WILL HAVE  
SUPER TOOLS, SA

BY SAM W  
U. S. AGRICULT

SUMMA

"The efficient farmer of a  
breed of farmer, with super  
two-year survey by Ford Mo  
agriculture will be like in the  
from carrot tops, cows with  
covering acres of cropland,  
apartment-like buildings, ph  
microbe refineries raising  
computer tape, buried wires  
some predictions by agricul  
many countries.

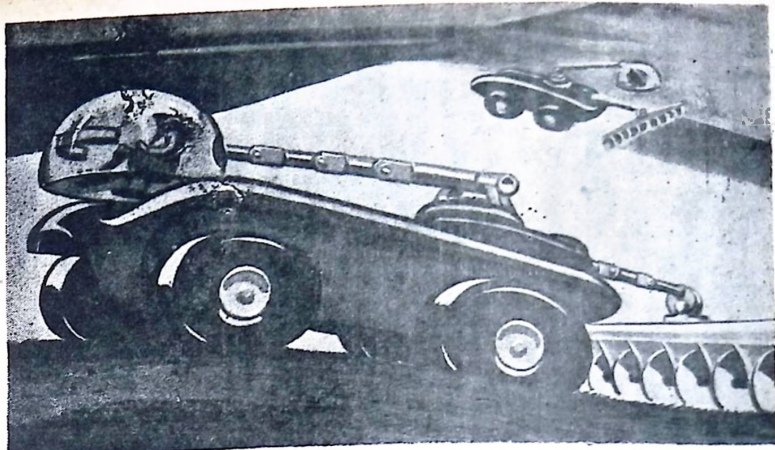


AIRBORNE—by turn of the century  
jobs from the air with equipment  
one machine which lifts off the ground

# FARMERS EAR

SKILLS AND  
RD SURVEY

CRIS  
WRITER



**TRACTOR OF THE YEAR 2000**—Powerful new farm equipment will be needed to handle crops. Tractors will run on four—or six-wheel drive or on pneumatic tracks, powered by electric drive, fuel cells or storage batteries. Pictured model can position operator in front or rear.

2000 will be a super  
and super tools," says  
company to learn what  
three decades. Milk  
offspring, plastic domes  
crop living in high-rise  
nal crop yields, vast  
teins, tractors run by  
ing devices—these are  
experts consulted in

conditions based on the  
quality and amount of light  
reflected by the earth. Sate-  
llites also will detect insect  
pests and diseases long  
before they can gain  
foothold.

When an infestation is  
found, farmers will spray  
crops with miniscule amounts

of powerful chemicals—a  
mere fraction of an ounce of  
insecticide per acre. By the  
year 2000, farmers will use  
harmless insects to control  
pests. Other effective biological  
controls will doom  
harmful insects.

Tractor cabs will provide  
air-conditioned comfort for  
the operator, and will be  
equipped with a food  
warmer, refrigerator and  
television.

## FUTURE FARMS

Farms of the future will  
bear little resemblance to  
those of today. The agricul-  
tural landscape will be  
dotted with many-storied  
apartment-like buildings,  
but the occupants will be  
not people but animals—  
cows, steers, sheep, pigs  
and chickens.

The building's tempera-  
ture, humidity, fresh air and  
light will be precisely regu-  
lated.

Waste products will be  
flushed through disposal  
pipes connected to a nearby  
treatment plant where the  
water will be purified and  
recirculated to drinking  
units.

The Ford study visual-  
ized six-wheel-drive tractors  
controlled by computer  
tape, buried wires or sens-  
ing devices. The tractors  
will be powered by electri-  
city from fuel cells or  
storage batteries.

"Cows, which will have  
quadrupled their own milk  
production by the year  
2000, will be backed up by  
the manufacture of identi-  
cal milk from carrot tops  
and pea pods," the Ford  
report said.

"Fertile eggs will be  
transplanted from superior  
cows into common incubator  
cows, allowing a superior  
cow to mother as many as  
1,000 calves in her lifetime,  
compared with today's ave-  
rage of 10.

"To completely control  
environment and growing  
conditions, huge plastic or  
glass domes will be erected  
to cover 10 or more acres  
(four or more hectares).

Plant growth will be  
automatically recorded so  
the farmer can provide the  
proper light, water and  
nutrients simply by turning  
a dial.

Continue on page 21



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combination helicopter-hovercraft. Engineers have already built  
air pressure to spray cranberry vines on rough ground.

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See page 18 for Rates. Advertisements should reach us a month before the date of publication.

**A SECOND-HAND** industrial centrifuge is converting the effluent from 1,000 pigs on a British farm from a nuisance to a valuable by-product.

As livestock production becomes more intensive in Britain, manure disposal has become a major problem on farms carrying large numbers of cattle, pigs or poultry on a small acreage (number of hectares).

If too much manure is spread on land it can do serious damage to fertility. There is also a risk that some manure from heavy applications may drain into rivers and cause pollution.

Mr. G. A. Wright, who fattens 1,000 pigs at a time on his three-acre (1.2-hectare) farm at Forest Lodge, Winkfield, Berkshire, was facing this problem in 1963. He decided that using a centrifuge to spin the semi-liquid manure at high speed could solve the problem, and he started experimenting with a borrowed machine.

His aim was to spin out the solid material from the semi-liquid piggy effluent. The solids he planned to sell as a horticultural manure and the liquid remaining he sufficiently purified to make disposal more easy.

**Bought Machine In Scrapyard**

After some initial problems of getting the effluent to the machine at a suitable rate, and removing the spin-dried solids, Mr. Wright was satisfied that the idea would work, and he bought a serviceable centrifuge from a scrapyard.

Now all the effluent from his slatted-floor piggeries drains to a concretelined holding pit 18 yards (16.5

metres) long, 5 feet 6 inches (1.7 metres) wide and 3 feet (91 centimetres) deep at the shallow end, with a fall of 1 foot (30 centimetres). When Mr. Wright wants to use his centrifuge, he first stirs the liquid in the pit, using a pump powered by a two horse-power motor.

The same electrically-driven pump can then be switched to deliver the stirred liquid to the centrifuge. The solids spun out by the centrifuge are then delivered by auger to a bagging-off point.

The unit can be left to run without attention, in which case the solids are allowed to accumulate in a heap on a concrete floor for packing later in polythene bags.

Mr. Wright spreads the liquid which has been treated

**TURNING TO GOOD**

on to pasture land through ordinary irrigation equipment, using 3/16 inch (4.8 millimetre) jets. With the solid material removed there is much less danger of blocking the jets, and less risk of damaging the land or causing water pollution.

The centrifuge he uses is



**FLUKES ARE SOFT, FLATTENED, LEAF-LIKE WORMS THAT EXIST IN VARIOUS PARTS OF THE ANIMALS WHICH THEY PARASITIZE. THESE WORMS HAVE RATHER COMPLICATED LIFE HISTORIES. THEY ARE TRANSMITTED FROM ONE HOST ANIMAL TO ANOTHER BY WAY OF A SNAIL CARRIER AND SOMETIMES BY WAY OF ADDITIONAL INTERMEDIATE HOST OR CARRIER.**

**FLUKES**

Although a number of different flukes have been recorded from pigs in various parts of the world, only two kinds are particularly important.

**The Common Liver Fluke**

The common liver fluke, *Fasciola hepatica*, is primarily a parasite of sheep and cattle, but also of other animals, including pigs. The worms are about 1 inch long by about one-half inch wide and live in the bile duct and bile canals of the liver.

Liver flukes in pigs are found only where the animals are kept on low, swampy ground. Such wet areas are likely to harbour aquatic snails, in which the early development of flukes must take place.

Sooner or later the young flukes leave the snails. Swine pick up the infestation when they swallow green forage or water harbouring the fluke in its infective stage.

**The Lung Fluke**

Lung flukes, *Paragonimus westermanii*, are thick oval

# PIG MANURE USE

a 15-inch (38-centimetre) bowl model powered by a 15 horse-power electric motor. A similar centrifuge factory-reconditioned, costs between £2,000 and £3,000, and would cope with a much bigger throughput than at Forest Lodge, where it produces about three tons of solids a week, with about 50 per cent. moisture content.

meeting transport costs and allowing discounts for quantity. The running costs for

by  
*Michael Williams*  
of the "Farmers Weekly"  
London

the electric motor is about £2 a week, says Mr. Wright, and depreciation £8 a week.

"My pig unit is about the minimum size which can justify the equipment and leave a profit," he said. "But I think it would be an

ideal system for a group of farmers to share on a co-operative basis. I would not only make a useful profit, it would also make manure disposal very much easier."

A spokesman for the Water Pollution Research Laboratory said that centrifuging had been used successfully for dealing with human sewage. He thought it could work well with piggery effluent and reduce the risk of river pollution. Mr. Wright's unit has already attracted the interest of Ministry of Agriculture Officers and of other farmers facing effluent disposal problems.

## Discounts For Quantity

Local gardeners buy the bagged manure for £17 a ton, and Mr. Wright reckons he is left with £10 a ton after

They leave the snails and develop further in crayfish. Pigs rooting in wet and boggy pastures have ample opportunity for bringing crayfish to the surface and devouring them. Once free in the digestive tract of a pig, the young flukes bore their way through

# PIGS: their Internal Parasites (2)

A U. S. A. I. D. Series

# FLUKES

the intestinal walls, wander to the lungs, which they penetrate, and there develop to egg-laying maturity.

## Damage

No special symptoms have been noted in affected pigs, largely because the infestation has not been studied extensively in these animals.

The presence of flukes in the lungs produces an inflammation. When an infested lung is viewed superficially the cysts generally appear as dark areas; if the cysts are deep in the lungs, the surface of this organ may show only a swelling.

## Treatment

There is no known treatment that removes lung flukes from pigs.

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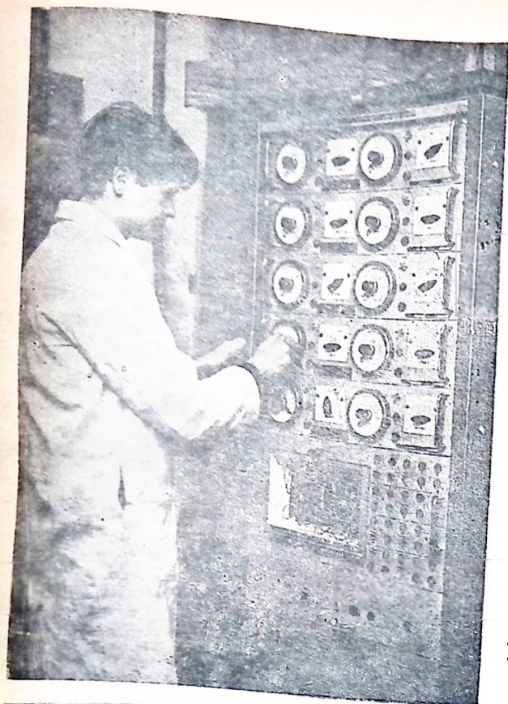
## Control

Control of lung-fluke infestation in pigs is based on the mode of transmission. Keep pigs off wet and boggy areas. If necessary, fence such areas to prevent access to them.



A well-bred sow - Llaca Marigold 6th Supreme Champion Recorded Sow at 1968 Bath West and Southern Countries - owned by a thoroughbred farmer. Only much care against parasites (internal and external) can ensure the high standard attained by this champion.

# AUTOMATIC FEEDING SYSTEM FOR LAMBS



MR. R. H. Johnson, left, a scientific assistant at the Grassland Research Institute, near Reading, southern England, sets the electronic timing mechanism at the control panel of the new automatic feeding system for lambs that was demonstrated recently at the Institute.

The aim of the new system is to help increase lamb production by feeding orphan lambs or lambs that cannot be fed by the mother (some ewes cannot provide even enough milk for two progeny, although some of the more prolific breeds produce up to seven lambs a litter).

The new system eliminates hand feeding of the 'extra' lambs and so cuts labour costs.

A farmer can put lambs on a feeding programme by pre-setting the central control panel, which he can vary according to the age and requirements of the animals.

Every lamb gets a controlled amount of cold milk substitute pumped through a ring main from a central tank from an individual teat specially designed for the equipment.

At the pre-set time, the feeding bar moves forward into the pen and is later withdrawn at the end of the feed.

Continue in next column



# CUTTING THE COW OUT OF MILK PRODUCTION



**SYNTHETIC MILK PRODUCED AT BRITAIN'S FIRST "DIARY FARM WITHOUT COWS" IS ATTRACTING WORLD-WIDE INTEREST. ON ITS HOME MARKET, THE PRODUCT, FIRST LAUNCHED EXPERIMENTALLY IN 1964, IS ATTRACTING RAPIDLY INCREASING DEMAND.**

The "milk" is claimed to be a complete substitute for the

## LAMBS

Individual controls at each teat bar make it possible to feed lambs at different stages of growth with the correct quantities of food.

Lambs (left) enjoy a feed from a new automatic feedings system developed in Britain and demonstrated recently for the first time at the Grassland Research Institute, near Reading, southern England.

The aim of the equipment is to help increase lamb production. Many ewes have difficulty in providing enough milk to feed more than one lamb and about fifteen per cent of the lambs die.

With this system, known as "Autowean", it is now possible to deal with any size of litter and eliminate hand feeding, thus cutting labour costs.

A farmer can put lambs on a feeding programme by pre-setting the central control panel, which he can vary according to the age and requirements of the animals. Once set, the system works automatically.

Continue on page 21

natural product. The makers, Plantmilk Ltd., of Tite Farm, Langley, Buckinghamshire, recommend it as a pure drink, for use in milk-based drinks, or as an alternative to cow's milk in cooking.

by

MICHAEL WILLIAMS

of the "Farmers Weekly"

London

The synthetic product has the same appearance as ordinary milk, but most people who try it agree that the taste is slightly different.

Continue overleaf

Continued from page 10  
**RAINY SEASON**

- Brooders should be lit well before the chicks arrive, to dry the litter completely and make it warm for them.

Even these precautions are not enough. One or other of the following is still necessary, the second being safer.

- Cover the area where the chicks are with paper, (empty feed bags opened out are good) for the first week, no longer. Change the paper when it gets dirty. This keeps the birds off the litter during the most susceptible period of their life.
- A better method, but costing a little more is to make wire floors on moveable wooden frames, a few inches off the floor of the house.

The chicks are kept on the wire floors for the first 10 to

Continued from page 14

## TURNING TO GOOD

worms, about one-fifth to three-fifths of an inch long and one-fifth of an inch or less wide. They exist in sacs or cysts in the substance of the lungs.

### Life History

The eggs produced by the flukes in the lungs are coughed up and swallowed and then discharged with the drop-

pings. In swampy areas the eggs hatch, and the young flukes get into certain aquatic snails, in which they develop.

Continued from page 19

## MILK

the possibilities are considerable.

### "Waste" A Valuable By-Product

He has recently returned from Mexico with samples of waste trimmings from cane at sugar refineries. Tests so far indicate that this could be a commercially valuable source of "milk".

"I found a good deal of interest there in the idea of setting up synthetic milk processing alongside the refineries," he said. "They have to get rid of the waste, and this could be a method of converting it into a valuable by-product. It should be possible to adopt the same procedure elsewhere in South America and in the West Indies."

"In other countries they are also processing wastes from crop plants which could be used. Banana leaves are one example, and we are in contact with someone in Italy who is interested in the process for using material such as pea vines at vegetable canneries."

"There is no waste problem with our process," he added. "The fibre we are left with after the process is completed makes excellent manure, and it is also possible to produce pchlorohyll as a by-product."

Continued from page  
**PARASITES**

The irritation produced by this flea causes the formation of ulcers which may result in blindness and death. Young birds often die quickly if heavily infested.

### WESTERN HEN PLEA

The western hen flea, *Ceratophilus niger*, is larger than the sticktight flea and is usually found in nest litter or occasionally free on the bodies of the birds.

It attaches to suck blood for short intervals only. In other respects its habits are similar to those of the sticktight flea.

### LEG MITES

Scal leg mites, *Knemidocoptes matans*, occur occasionally on poultry, usually only on old birds which should have been culled.

They borrow themselves into the skin of the legs where they live, and are almost microscopic in size, therefore can be identified better by the symptoms they cause: loose scales, swellings, and a rough appearance of the legs and feet of infested birds.

When birds are left untreated, the legs and feet may become so distorted the birds have difficulty in walking.

### BED-BUGS

Bed-bugs, *Cimex lectularius*, *Haematosiphon inodorus* are rarely found on poultry. They are flattened like chiggers, and have similar feeding and hiding habits.

They are about  $\frac{1}{4}$ " long, yellowish, and have three pairs of legs.

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Subscription Rates: 6 months: 7/-, (post inclusive) 1 year: 12/- (post free)

Continued from page 1

## MILK PRODUCTION

It is sold in three-quarter pint (0.43-litre) cans at double strength, and when diluted with an equal volume of water the analysis is similar to that of natural milk. Sugar content is slightly under 20 per cent, and there is 3.25 per cent vegetable protein and 3.25 per cent vegetable fibre. Solids extracted from vegetable matter, or soya protein base with added vegetable oils and sugar. In either case a full range of vitamins is added.

### Ninety Per Cent Efficiency Coming

The process for producing "milk" from vegetable matter by machines instead of cows was first developed by Dr. H. B. Franklin, who is now technical adviser to the company.

He designed special equipment to lacerate the plant material, extract the liquid from it and convert these through chemical processes to "milk."

"With the machinery we have at present we can extract 80 to 85 per cent of the protein from vegetation," he said.

"But I think it will be quite possible to get this up well above 90 per cent as we improve the technique.

"We are already a good deal more efficient than the cow at protein production. Cows convert only about 20 per cent of the protein they eat into milk."

Dr. Franklin has experimented with a wide range of plants as raw material for his process. The best results, he says, come from vegetable matter with a high moisture content, such as pea vines. Stinging nettles and sugar beet tops have also been used successfully, and he claims that even bracken can produce an acceptable synthetic milk.

Continue in next page

Soya bean protein is being used at present in place of fresh vegetable matter, for convenience. This has proved an acceptable alternative until more reliable supplies of plant material can be arranged. The company is now negotiating with major food processing firms for a steady supply of waste vegetable matter, especially from vegetable canning.

### Ready Market

The synthetic milk, brand name "Plamil," is finding a ready market in spite of being more expensive than cow's milk. The retail price is 2/11d. a can, which contains the equivalent of one and a half pints (0.85 litres) of natural milk.

Cost is determined mainly by throughput. Last year sales increased by 30 per cent to reach more than 600 gallons (2,728 litres) of milk a week. This level of production must carry all the overheads of labour, processing, pasteurising and canning equipment and other costs.

A substantial increase in sales could bring the price down, said Mr. C. J. Cross, who is in charge of administration at the factory. He believes that eventually it might be possible to sell synthetic milk in Britain at the same price as cow's milk, or even more cheaply. "But that won't happen for a long time," he added.

"Plamil" sell throughout Britain in health food shops and direct to hospitals. The customers are vegetarians, people with an allergy to cow's milk, and those who believe that animal fats may be harmful to health. Medical interest in synthetic milk is growing, said Mr. Cross, and accounts for a large share of the sales increase.

Besides the "milk" there is a growing range of foods which contain "Plamil". So far these are a chocolate, fudge, and a canned pease pudding. A synthetic cream is now nearing the production stage and the company is also

interested in developing a synthetic cheese.

### Big Overseas Interest

Dr. Franklin described overseas interest in the "milk" as tremendous. There have been inquiries from countries in Africa, South America Europe and the Far East, and negotiations are under way with buyers in Canada and Sweden.

"Plamil" has already been sold to New Zealand, a country which supplies large

quantities of dairy products to Britain, and to Holland and South Africa. Exporting is eased by the fact that the "milk" will keep indefinitely at normal temperatures in the can. Out of the can its life is similar to that of ordinary milk.

The big problem in exports has proved to be the regulations in some countries which have to be overcome. These often arise because synthetic milk is difficult to classify, but also because of special requirements in some countries for vitamin

content.

But Dr. Franklin's original idea was to export the process itself, so that synthetic milk could be manufactured locally. He believed this would be of special interest in countries with a shortage of food protein, and in areas where dairy farming is difficult.

He is now examining sources of waste vegetable material from other food processes as a supply of low-cost raw material for making "milk" and believes

Continue on page 17

## NEW BRITISH MOBILE VETERINARY CLINIC



A completely new kind of mobile veterinary clinic has been built by a British firm to on-the-spot treatment of animals. Here, its team are examining a goat for signs of disease.

The clinic is an entirely self-supporting unit capable of operating 800 kilometres from the nearest base, having its own electricity and water supplies with accommodation for two and a tent to be used for additional member of the team if required. Designed for operation in difficult terrain, the vehicle carries towing winches that can be used to tow other vehicle, rescue animals - or get themselves out of trouble if necessary. The surgery is fully equipped to carry out vaccination programmes, diagnose and treat sick animals and mount educational programmes for farmers in isolated areas. Incubator, analysis instruments, a refrigerator microscopes and stores of vaccines are included amongst the equipment.

Builders: Thomas Kosking & Sons, Danbolls Road, Cardiff, South wais.

Continued from page 10

## RAIN SEASON

14 days of life. After that they are allowed to run on and off as they wish until the floors are removed at 3-4 weeks old.

The brooders are on the frames, and the chicks are kept in place by a moveable circle of hardboard 2 feet high. (An 8' by 4' sheet cut in half which also cuts down draughts. The best wire is 1" by 1" square mesh, but expanded metal is more easily available in some places and will do if paper is put under the brooder for the first 2 days until the birds get used to walking on wire.

It is very unlikely that there will be any outbreak of Aspergillus if these precautions are taken. However if a farmer does suspect that his birds have the disease he should.

1. Seek Veterinary invest

igation to be sure that the disease is what he thinks, and when the disease is confirmed seek advice on what action to take.

2. If the birds are less than two weeks old cover the litter with clean paper and keep it covered until the birds reach two weeks, changing the paper when it gets dirty.
3. Kill badly affected birds, as they will never do well and only eat food to no profit.
4. Take good care of the rest of the birds in the flock so that they can recover and make some profit.

*But if all the precautions recommended in this article are taken there is no reason why there should still be so many losses from Aspergillus every rainy season. There is no need for expensive medicine, only taking care.*

## RABBITS

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Continued from page 8

(NEWS)

FARMING BRIEFS

### PRODUCE PRICE

THE Chairman of the Northern States Marketing Board Alhaji Ibrahim Dasaki has announced prices for cotton well in advance of the growing season. The harvest and sales starts next November. This early announcement is meant as an incentive for the farmers who will receive 6d per lb for Grade I cotton, 5d per lb for Grade II and 4½d per lb for Grade III.

X X X X X

### UNIFORM COFFEE PRICE DEMANDED

The entire coffee planters of Mambilla in Sardauna Province of the North Western State, have demanded a uniform price for coffees. They threatened that unless a fixed price was announced for the crop, they would switch over to other crops.

X X X X

### NORTH WEST STATE PLANS FARM SETTLEMENTS

THE Government of the North Western State is

to build two new Farm Institutes, at Bakura and Kuta, Sokoto and Niger Provinces respectively as soon as the recently approved grant of £512,522 from the Federal Government is made available to the State's Ministry of Natural Resources and Corporatives.

X X X X X

### NEW ORGANIZATION TO PROMOTE WEST AFRICAN RICE PRODUCTION

\* An organization to promote rice production in West Africa will be set up at a meeting in September, the United Nations Food and Agriculture Organization (FAO) announced in Rome recently.

The meeting, to be convened at a yet to be determined city in West Africa, is being arranged by the FAO, the United Nations Development Programme & the Economic Commission for Africa (ECA).

Continue in next column

RICE

Continued from centre spread

FARMERS OF THE YEAR 2000

Participants included representatives of the bilateral assistance agencies of the United States, France, the United Kingdom, Canada and the Netherlands, as well as the Rockefeller and Ford Foundations.

The group discussed the growing gap in West Africa between the demand for and production of rice. Increased spending of scarce foreign currency by West African nations to import basic foods was noted with alarm.

Frank Pinder of the ECA told the representatives that West African countries are anxious to increase their rice production but hope for outside assistance.

And at Igbotako and Bokoda areas in Okitipupa Division, the Government has established a big palm plantation costing about £4.2 million pounds.

**BANK TO FINANCE FARMING**

An Agricultural Credit Bank with initial capital of £3 million pounds is soon to start operating to help farmers throughout the Federation

his step has been taken in view of the general and enthusiastic switch towards farming. The information was disclosed recently at Kaduna Airport By Dr. Bukar Shaib, Permanent Secretary, Ministry of Agriculture. An important aspect of the facility is that it would not be on state level. Each farmer would be dealt with on merit and beneficiaries will be studied all over the Federation.

Unlike many other projects which will be undertaken until after independence, this farmers' Credit Bank Scheme is timed to begin operations as practicable

"Today's tall corn stalks will give way to new, squatly plants like pine trees to absorb more energy from the sun, and the ears will be attached to the top for easier harvesting.

Corn yields by the year 2000 will zoom to 500 or more bushels per acre (31 tons per hectare) compared with today's highest average of about 75 bushels in highly developed farms (4.6 tons per hectare)."

PREDICTIONS

The Ford study predicted fantastic yields in other crops, too.

For example :

Wheat—300 bushels per acre (eight tons per hectare), compared with today's average of 27 (1.8 tons).

Soybeans—175 bushels (4.7 tons per hectare), compared with today's 25 (1.6 tons).

Milk—30,000 pounds (13,600 kilograms) of milk per cow per year, compared with 8,000 (3,630 kilograms).

Beef—1,000 pounds (450 kilograms) of beef at 10 months of age, compared with 750 (340 kilograms) today.

Forage—30 tons of forage per acre (74 tons per hectare) compared with three (7.4 tons.)

"Agriculture today is an extremely complex field, and when elements of future technologies are added to this, the final results could be staggering," said John A. Banning, Ford official.

The heart of the efficient farmer's operations of the year 2000 will be a control centre equipped with a wide array of electronic wizardry to help him produce crops two to five times as abundant as those of today."

SKILLS

Farm labourers of the future will require special professional skills to operate the sophisticated equipment.

The farmer himself will have to be very knowledgeable and college-trained in many subjects — among them big business management, electronics and computers, biochemistry and biophysics.

American farmers are not only helping to feed millions throughout the world today, but the war on global hunger in the next three decades, as the world population doubles in size, will be largely won by America's expanding agricultural science and technology, in the opinion of experts consulted by the Ford survey.

Mr. Banning said the illustrated Ford report will be translated into Spanish, French, German, and other languages and will be made available for public showings throughout the world.

Dr. Carl Hall, chairman of Michigan State University's agricultural engineering department, and Dr. John Harris, associate professor in agricultural economics, participated in the Ford survey.

quantities of food.

The system, which has the backing of the British National Research Development Corporation, has already excited interest overseas. The Canadian Department of Agriculture has ordered a 1,600-teat system and some 50 enquiries have been received from thirteen countries.

MANUFACTURER

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Like every other good magazine it informs you well thus keeping you abreast with developments in the agricultural sphere.

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The New Equipment and Advisory Services Sections see to it that new ideas and methods are timely passed round to ensure maximum returns from investments.

**FARMSTOCK**

ALWAYS FARMSTOCK P.O. Box 79, E.B.

Continued from page 17

LAMB

Every lamb gets a controlled amount of cold milk substitute pumped through a ring main from a central tank from an individual teat specially designed for the equipment.

At the present time, the feeding bar moves forward into the pen and is later withdrawn at the end of the feed. Individual controls at each teat bar make it possible to feed lambs at different stages of growth with the correct

# LAUGH

!!!  
 "Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

WHILE the guest at a wedding reception stood around talking in small groups, I overheard an elderly gentleman asking a young man: "Are you the bridegroom?"

"I'm afraid not," he replied, "I was eliminated in the semi-finals."

SUCCUMBING to my teenage daughter's urging to dress more fashionably, I bought a boldly flowered dress and shortened it to six inches above the knee. Bright pink stockings were purchased to complete the outfit. I didn't show the dazzling ensemble to my husband, but wore a coat over it as we set out for a party. I intended to surprise him and our friends with the new me.

When I flung off my coat at the party, a startled look crossed my husband's face. Then he announced to 30 people: "Well, you see, I couldn't afford a new wife—so I had the old one re-covered!"

I WAS BUSILY typing in my new job when a fellow employee came along and perched on my boss's desk near by. As they chatted, I heard him ask my boss, "How is the new typist coping along?"

"Well," my boss answered after a moment of thought, "I don't pay much attention to her typing, but I certainly snap to attention whenever she shifts her carriage."

## AGENTS WANTED

Intelligent and reliable persons wanted all over the Federation to sell on good commission and terms:

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FOLLOWING A game of football, two men were dressing to go home. One fellow began putting on a woman's girdle.

"Good heavens," said his companion, "when did you start wearing a girdle?"

"Since," panted the first man, struggling to get the thing on, "my wife found it in the glove pocket of my car."

Dele had been asking his father for money rather too frequently. My husband decided it was time for a little lecture.

At the end of his talk he asked if Dele realized how long and hard he worked to get the money he had.

Dele was silent and thoughtful a minute, and then answered, "You're lucky. I have to beg for mine!"

MY ELDEST daughter was about to start kindergarten and I had to answer a questionnaire about her personality and development. Meeting a neighbour whose son was also starting, I asked her what she thought of the questionnaire.

Her answer summed up my feelings completely. "I'm torn," she said, "between telling the truth or giving him a good start."

## OPINION POLL

What do you think of

## FARMSTOCK?

Write to the Managing Editor, P. O. Box 79 EB, giving your ideas, suggestions or criticisms. You may thus be helping us give the public what it wants.

When a ten year old boy came from Sunday school, his mother asked him what he had learnt that day "Well," said the boy, "our teacher told us how God sent Moses, behind the enemy lines to rescue the Israelites from the Egyptians. He brought es from the Red Sea, and then Mo- then the engineers to build a ses ordered the engineers to build a pontoon bridge. After they all crossed over, they looked back and saw the Egyptian tanks coming. Quick as a flash, Moses grabbed his walkie-talkie and asked the air force to send bombers to blow up the bridge and save the Israelites".

"Bobby" exclaimed his mother". Is that really how teacher told the story?"

"Well! not exactly," Bobby admitted. "But if I told it her way, you'd never believe it."

ON MY rounds as a salesman, I called regularly on a friendly old lady who always offered me a tea and delicious home-made bread.

One afternoon I arrived to find her old-fashioned wireless blasting out a lecture on Ancient Egypt.

"I didn't know you were interested in ancient history," I said.

"Oh, I'm not listening to it," she replied, "but the valves get just hot enough to make the dough rise in that bowl on top of the set."

RECENTLY my husband was summoned to appear in court on a motoring offence. The man just ahead of him was charged with driving the wrong way down a one-way street. The magistrate asked the man if he had anything to say in his defence. "Yes," he replied. "But I know you won't believe it."

"Well, go on," snapped the magistrate.

"You see," explained the man, "my wife said, 'Turn here,' so I turned."

Early in the school year, I told beginners at French that flu-

would be achieved when they be- to dream in French. A couple months later, one of my more enthusiastic pupils burst into the class room and blurted out to me, "happened! It happened! Last night I dreamed in French! Everybody talking French!"

"That's wonderful" I said. "Do you remember any of the conversation?"

The boy's face fell a trifle at replied, "Well actually, I can't understand a word they said."

BACKSEAT driving isn't always vocal. A friend tells about his dery father, whose daughter has been driving for some years while old man travelled with her.

He never said a word about driving until one day when his happened to be with them. Then old gentleman muttered nervously, "Watch the road for a minute, you, Bob, while I tie my shoelace."

## CLASSIFIED

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MANAGING EDITOR Abiodun Ojugbele

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## New Equipment



**T**he age of co-operation has arrived. With mechanisation of farming and stockbreeding, huge machines are appearing on the farm — tractors, harvesters, feed-mixers and what have you ?.

The latest addition to this automatic 'helpers' relieving the farmer of a lot of laborious task is the **AUTOMATIC EGG GRADER & PACKER** first mentioned in our Feb' 69 edition. A British firm has perfected an egg grader. Since customers are choosy and it pays the farmer to sort out the eggs into grades for different prices the egg grader becomes important particularly on farms producing about a thousand eggs, daily. The idea of co-operation comes in if a number of neighbouring farmers or those feeding big cities — Lagos, Ibadan, Kano, Kaduna, Benin or Port Harcourt can contribute sums to purchase a machine to serve all the various farms together. Or an enterprising egg dealer can buy this equipment shown above. Since eggs come from various sources, the grading by the dealer will just be a matter of a few hours with this grader.

In principle the machine is sensitive to the weight of each egg. Girl can operate the automatic, high Capacity loading, candling, grading and packing unit—capable of handling 10,800 eggs an hour. The eggs, 15 at a time, are passed on a three-track conveyer into a candling unit, where powerful lights and mirror reflection help, in the detection of all types of egg fault. From this stage the eggs move on and are sorted, by weight, into their correct grade. Final stage embraces the stamping of the eggs, which are aligned and collected into rows in the packing head. Here sets of nylon fingers receive and gently place the eggs into automatically conveyed cartons.

The machine is ready for export. The manufacturers will entertain enquiries from overseas, for further particulars contact **BEV NEVIS EGG EQUIPMENT LTD, TROWBRIDGE, WILTSHIRE, ENGLAND**, and please mention Farmstock Magazine as your source of information.

Advertisement

# WORM INFESTATION

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## IN POULTRY

---

DO YOU ALWAYS REALIZE THAT WORMS CONSTITUTE A BIG THREAT TO YOUR PROFIT MARGIN FROM POULTRY AND PIGS? HERE ARE SEVERAL WAYS IN WHICH WORMS (ASCARIDS) ADVERSELY AFFECT YOUR ANIMALS AND THEREBY DRAIN AWAY YOUR MONEY:

1. Reduced vitality and increased susceptibility to diseases like pneumonia, gastritis, and anaemia.
2. Intestinal upsets such as diarrhoea or even blockage of the intestinal track by worms when present in large numbers.
3. Loss of egg production in poultry.
4. Reduced growth rate, your poultry take a longer time to reach profitable point of lay.
5. Increased mortality from worms and diseases which are aggravated by them.

You all know that when animals are healthy, they are able to withstand diseases more than when they are weak. At certain stages of the worm's life, they feed from the blood of the hosts (birds) while at other stages, they live directly on the food which their hosts have eaten.

Different stages of growth of worms are found in different parts of animals body - in liver, heart, lungs and finally adults and eggs in the intestine. In all these body organs, the worms can cause

severe damage. The havoc which worms have been causing in your poultry and pigs is now very clear.

These symptoms will help you to suspect that your poultry is infested by worms: Growth retardation, pneumonia, gastritis anaemia, reduced egg production, loss of vitality, increased mortality.

**CLEAR WORMS WITH  
GLOBE PIPERAZINE  
WORMER**

By using Pfizer Globe Piperazine Wormer, you can avoid the problem enumerated above. Here is how to make the wormer work:

(a) POULTRY: 4-6 WKS

Use two spoons (1 fluid ounce) per two gallons of drinking water for one day.

ABOVE 6 WEEKS:

Use 4 table spoons (2 fluid ounces) per 3 to 4 gallon of drinking water.  
Repeat the following day.

(b) PIGS AND HORSES:

Use 2 table spoons per 100 lbs. body weight as a drench or mixed into palatable feed. Dose pigs just before weaning or 4 weeks prior to farrowing.

N. B. Do not give any feed or water until the medicated ones have been consumed.

Repeat the above dosage one month later in order to clear out the worms completely.

Also, remove litter after deworming so as to avoid any reinfestation. And because deworming imposes a stress on your animals, give TERRAMYCIN (Oxytetracycline hydrochloride) Soluble Powder for at least 2 days before deworming, and continue for a minimum of 3 days after this operation in order to overcome the stress.



# WORMS

MONTHLY ADVISORY SERIES

Preparing for th

THERE ARE MANY DIFFERENT KINDS OF WORMS WHICH CAN LIVE IN CHICKENS. SOME DO LITTLE HARM TO THE BIRD, AND OTHER KINDS ARE SO UNCOMMON THAT THERE IS NO NEED FOR POULTRY FARMERS TO WORRY ABOUT THEM.

There are three or four common kinds of worms that can do damage on farms that poultry farmers ought to know about so that they can take steps to prevent them.

The commonest worm is called *Ascaridia galli*, the large roundworm of poultry. It lives in the upper half of the small intestine, and is between one and two inches long. Although thin it is quite easy to see. Both male and female worms live in the birds' intestine all their lives.

Eggs laid by the female worm pass out in the bird's droppings, and may in time be eaten by another bird. After the worm eggs have been passed out it is some time before they can infect another bird, usually about 10-40 days. If another bird eats the worm egg before the

time it will not become infected. If no bird swallows the worm eggs for a long time it will then die.

The number of worm eggs which die depends a lot on the conditions. More will live to infect other birds when litter is wet than when it is dry. After an infective egg has been swallowed by a bird it hatches into a young worm and grows during the next 7 weeks into an egg laying adult worm. While young the worms burrow into the lining of the bird's intestines, and if there are many worms they may damage it severely. A small number of adult worms do little harm to the bird.

The damage is done by large numbers of young ones.

Here are some precautions which farmers should take to prevent worms:

- (1) If birds are reared and lay in cages they will not get worms.



One of the latest hybrid hens developed by Thorner Brothers Ltd., of Yorkshire, northeast England is the New 404 Plus, pictured here. Field tests have shown it to have an average production of - 246 eggs a year, six more than the 404 it replaces.

## POULTRY

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- (2) If the litter is dry most of the worm eggs will die before they reach the infective stage, and it is not likely the birds will suffer much.

- (3) Worm eggs can live in a poultry house from one batch of birds to another. If the floor is made of earth the number of worm eggs which survive increases each time a new lot of birds goes through, and the problem gets worse and worse. Concrete floored

houses can easily be cleaned and disinfected so that it is much less common to find birds suffering from worms in concrete floor houses than in those with earth floors.

#### EFFECTIVE REMEDY

The cheapest and most effective remedy for roundworms is Piperazine. This remedy is made and sold by several different companies, but all the forms of it are equally

Continue on p. 13

Rainy Season (2) by L. J. Elmslie

# COCCIDIOSIS IN CHICKENS

Coccidiosis is one of the most serious diseases of growing chickens, either replacement layers or broilers, and is found wherever birds are kept. There are different forms of the disease each caused by a different type of coccidia, but all are fairly similar to each other, and scientifically are all species of the Genus *Eimeria*.

The nature of the disease and the means of preventing it can best be understood by studying the life cycle of the coccidia.

Coccidia are very small and can only be seen through a microscope. They spend most of their life cycle in the bird's intestines, but there is a phase called the oocyst which can survive outside the bird for a very long time. When a bird swallows one of these oocysts the hard skin of the latter becomes soft, and eight coccidia called sporozoites are released into the bird's intestines.

Each one then enters one of the cells lining the bird's intestines, where it grows. Eventually the cell dies and bursts and many of a new form of coccidia called merozoites are released into the intestines. Each merozoite enters another cell, and so the process continues, damaging the bird's intestines while the coccidia multiply.

Eventually the coccidia enter a sexual phase which results in oocysts. These are passed out in the droppings. At first the oocysts are not fully developed and for 48 hours need very moist conditions and also sufficient air

After 48 hours the eight sporozoites have formed inside the oocyst and it has also developed a hard shell, which resists heat and cold, wet and dry.

## EFFECTS

The damage to the bird comes from the destruction of the cells of the intestinal lining. In some types of coccidiosis there will be bleeding and deaths.

In milder cases the birds grow thin and even though they do not die may never develop properly. Broilers which have had coccidiosis may be too badly finished for the frozen trade, and egg production from layers which have had the disease in the growing stage will be reduced.

Food consumption which falls during the course of the disease may be higher than average after the birds recover.

Symptoms of coccidiosis are birds standing about with drooping wings, and head drawn back to the body. They do not eat much, become thin and may die. One type of coccidiosis caused by *Eimeria tenella*, caecal coccidiosis, can be recognised by blood in the bird's droppings.

This is because this species attacks the bird's caeca, and these are full of blood when the birds are post mortem. Other species attack other parts of the intestine, and although there is no blood in the droppings inflammation of the intestine can be seen at post mortem.

It is possible on post mortem examination to see which species of Coccidia have caused the outbreak on a particular farm. This is a matter for experts, who will look at which part of the intestine has been attacked,

since each species has its own particular part, and will also look at the oocysts under the microscope, since the oocysts are a little bit different in each species.

The other two serious coccidia besides *Eimeria tenella* are *Eimeria necatrix* and *Eimeria brunetti*. The other five species are not often so severe as these three. Sometimes a flock of birds can get one species of coccidia followed by another but it is very unusual to have two attacks of the same species in the lifetime of one bird, as the birds become immune.

## PREVENTION

Prevention of coccidiosis is by one or more of the following methods.

(1) Keep birds in battery cages so that they are out of contact with droppings and cannot eat oocysts. This is the most effective method.

(2) Clean out deep litter between batches and disinfect the floor. The floor should be concreted, as it is impossible to kill all the oocysts on an earth floor.

(3) Keep litter dry. Oocysts newly passed need a very high humidity for the first two days. If the litter is dry most of them will die, but if it is wet most will survive and infect the birds. Round the drinkers is the most dangerous place for wet litter.

(4) Feed a coccidiostat in the feed.

It is normal nowadays to feed a coccidiostat, a drug to control coccidiosis, in broiler and chick feed, but not in layers rations. This will prevent serious trouble most

of the time. However it is important to know that feed manufacturer only include enough coccidiostat to prevent this disease under average farm conditions.

If the birds have to suffer a very heavy infection, due for example to the re-use of old litter or to damp litter, or old earth floor, they will still get the disease. Prevention by the farmer is still necessary as well as by the food compounder. The farmer should of course always make sure that he is getting food which contains a coccidiostat in his broiler and chick rations. All good food compounders include them automatically.

## TREATMENT

Treatment for coccidiosis is by a drug given in the drinking water. This is because birds which have this disease almost stop eating and continue to drink. Before treating a flock of birds which have a coccidiostat in their food always ask food manufacturer's advice, as some can be poisonous if birds gets too much, for example by getting a coccidiostat in feed perhaps the same in the drinking water as a cure.

Continue on page

**THERE IS A SPECIAL DEMAND FOR LARGE CHICKENS, EITHER COCKERELS OR BROILERS AT CHRISTMAS, AND FARMERS WHO DO NOT NORMALLY PRODUCE TABLE BIRDS MAY FIND IT WORTH WHILE REARING A BATCH FOR THE FESTIVAL. THE SAME THING IS ALSO TRUE, BUT TO A LESS EXTENT FOR OTHER FESTIVALS.**

Farmers who do decide to rear special batches for festivals must be careful not to compete directly with year-round broiler producers, who are fully equipped with freezing and packing plant, and can produce frozen birds at less cost, and of better appearance than can the ordinary farmer. Instead it is better to concentrate on selling all birds locally, and if possible live. In that way costs will be kept to a minimum.

**QUANTITY**

The farmer thinking about Christmas poultry will first of all have to decide how many birds to rear. First he must think about the selling of them. How will the birds be sold? How many can he sell in each way?

It is always better to have a few birds than two many, so he should be cautious. Secondly he must decide whether to rear the birds. It is not likely to pay to make a special building, since it would not be used for very many weeks in the year, so the best thing is to use a building that is used for some other purpose the rest of the year, or

which happens to be empty.

The number of birds to be reared may be limited by the space available as well as by how many can be sold. As a general guide about 200 birds is quite enough for some one who is trying to sell Christmas poultry for the first time. Someone who is well established, and nows he can sell more can expand from year to year as demand for his birds increases.

**TYPES**

What is the best type of bird to rear for Christmas trade? There are three types which may be profitably used, and the choice will depend on the sort of customer to whom the farmer expects to sell, and on the availability and cost of each.

(1) **Pure Broilers** are the fastest growing, and therefore the most expensive to buy as chicks. They should be chosen when customers require each bird to be large. Also they have the best conformation, and must also be chosen when customers insist on that. Because of the much better conformation, which is seen most clearly in a frozen bird, it is essential to use pure broiler breeds if they are to be sold in this conditions. If the birds are to be sold live, however to customers who are less concerned with the appearance of the carcass than with that of the live birds, pure broilers may sometimes make less profit than crossbreds or cockerels, because the birds still look young when they are ready to eat, but a cockerel of

**Business Opportunities:**

a heavy laying breed looks more mature when it is ready for eating.

(ii) **Cockerels of laying Breeds.**

Not all cockerels are equally suitable. Those of the light hybrids based on the white Leghorn Breeds will never grow to the size needed for a christmas birds. Cockerels from medium hybrids mostly brown egg birds will grow to quite a good size, and are cheap to buy as day olds. They are not suitable for freezing, but sell well alive.

(iii) **Crossbreds between a broiler and a brown egg laying strain.**

These are a compromise between the last two types bred by using a broiler, type cockerel on a laying type hen.

The chicks are cheaper to produce than pure broilers, because the female parents lay more eggs and eat less food than broiler parents, and are quite useful table birds although slower growing than pure broilers and dearer to buy than layer cockerels.

**CORRECT FEEDING**

Correct feeding of table birds is very important for profit. The aim is to get the bird to eat as much as possible and as soon as possible. There are two reasons for that. Firstly the younger a bird is the better it is at turning food into meat. The food conversion rate in a typical case falls from one pound of meat from 1½ pounds of feed in the first week to one pound of meat from 3½ pounds of feed in the 10th week.

**CHICKENS**

**MONTHLY ADVISORY SERIES**

Therefore growth made in the first week is cheaper for the farmer. Secondly a bird needs quite a lot of food for maintenance. Any that is left after that is used for growth, so if a bird is a bit short of food it will maintain itself all right but will not grow, so the farmer gets nothing for his expenditure.

The correct type of food to use varies according to the breed chosen and the age to which the birds will be kept. All table birds should begin on broiler starter ration. Broilers should change from this to a broiler finisher at 4-5 weeks old and stay on it up to 9 weeks.

Larger birds to be kept over 9 weeks can be feed most economically be by adding ground maize or ground corn to broiler finisher after that age

increase the proportion gradually as the birds grow up to a limit of 30%. The best growth rate from cockerels will be obtained from the same feeding plan, but the higher cost of broiler food makes it more economical to use broiler starter for two weeks only and then chick food to 8 weeks.

The feeding of broiler finisher for the final two to three weeks of life will improve the finish of the birds, so depending on the size at which the birds are to be sold either go on to broiler finisher plus maize according to age, or include a period on ordinary growers ration. Feed cross bred birds as broilers.

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# Poultry for Xmas

## FORM OF FOOD

The form of the food is very important. Table birds should always be feed pellets or crumbs to make sure of maximum growth. Skin colour can be altered by feeding in the same way as yolk colour in layers. Yellow colouring from yellow maize or grass will go into the birds skin, but not in all breeds.

By

J. ELMSLIE  
M. A. (Cantab)  
of L...ka & Thorner Ltd.

or 4 inches of long trough per bird. Otherwise housing for Table birds is just the same as for growing pullets on litter.

## CAPONISATION

Chemical caponisation can be used to improve the carcass quality of cockerels. A tablet of hexoestrol, a chemical similar to the female sex hormones, is put under the skin of the bird's neck six weeks before it is due to be killed. The tablet slowly dissolves into the bloodstream, and the birds begin to look more like hens than cocks. Also they fatten more, but since the comb and wattles shrink the appearance live is not so attractive.

Caponisation is satisfactory if there is no risk of people eating the pellets, for example if the birds are to be sold frozen. But if the birds are to be sold live it is better not to risk an undissolved pellet being eaten by a customer, since it can affect people as it can birds.

## PROFIT

America prefers yellow skinned birds, and they use both yellow skinned varieties and food containing yellow pigments for their broilers. In Britain white skinned birds are preferred, and these can be produced either by using white skinned varieties or by excluding yellow maize and grassmeal from the ration.

Birds for the Christmas trade should be kept on litter. It is important to have a good depth, 4-5 inches, to prevent breast blisters and avoid intestinal diseases. Probably it will not pay to have special buildings for Christmas birds, so one used for rearing layers during the rest of the year may be used.

The area required per bird is 1.25 - 1.75 square feet per bird according to the size they will be reared to, and for feeding there should be 5 tube feeders per 100 birds,

To say what the profit should be from Christmas poultry is not easy. The farmer should keep a careful record of food and chick costs. To record all other costs, however, is tedious, and as the total is likely to be small he can assume that if he adds 9d. a bird to feed and chick cost he will have allowed enough for small expenses such as litter, fuel and overheads.

One should look for at least 1/- a bird on Christmas chickens, if the business is to be counted as a success, but of course prices will depend on the market and vary from year to year. Also the price the farmer gets will depend on how many birds the farmer sells retail, and how many wholesale, which will



## A New Breed of Birds

*The Ross Rocket, one of the new British birds being marketed. It weighs less than four pounds (1.3 kilogram) and is as prolific as heavier birds despite eating considerable less food.*

*It is only under standard conditions free of diseases that the birds like this can fulfill such claims as are made of the Ross Rocket.*

*Though not good as broilers because of its demure stature, a Xmas season egg prospector can bank safe on this egg laying 'machine' to make more money at period when everyone likes to use eggs for one type food or another.*

depend on the position of the farm and the scale of production.

In a good year profits of several shillings a bird may be made, but will depend on

careful management of birds, great attention to feeding, and so having the quality of bird for sale the time they are wanted.

# FARMERS FIND NEW IN CO-OPERATION

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*See page 14 for Rates.  
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us a month before the date  
of publication.*

It has long been the policy of Government in Britain to make agriculture more efficient, so keeping down the costs of food production while at the same time maintaining farm incomes. Recently this has been done by providing production grants for improvement and free advisory services.

But in 1967 the Minister of Agriculture, then Mr. Fred Peart, authorised the formation of a new body, the Central Council for Agricultural and Horticultural Co-operation. Its job is to encourage farmers to get together and pool their resources for production and marketing.

After only 18 months existence, the Council is making a big impact on the farming scene and giving great impetus to the co-operative movement.

## RIISING COSTS, STATIC PRICES

Farm costs are rising by at least 5 per cent a year and farm prices, at best, remain the same. Co-operation provides one of the few ways in which costs can be cut, perhaps with fewer men, less machinery or cheaper fertilizer, and returns can be improved by getting better contracts, for instance, or doing more on-farm storage and processing.

The Council, which gets all the money it needs from the Government, with no particular limit, has enviable powers for grant-aiding projects and the less enviable responsibility of deciding which projects warrant help and which not.

When a new co-operative is set up, the Council can pay up to one-third of the cost of buildings, fixed equipment, working capital and management expenses—and would like to extend its grant powers further, to offer a simple lump sum incentive to co-operators even when expenditure involved does not attract grants.

In its first year and a half, the Council has looked at 322 schemes and dispensed £886,000 in grant for schemes whose total value runs to nearly £4,000,000.

About 40 per cent of the approved schemes have been horticultural—for the production, grading, storage and marketing of fruit and flowers—and half the schemes have been for co-operative marketing. Vegetable and pea growers have been quick to take advantage of grants, followed by cereal potato production, storage groups, and grass drying and silage groups.

Livestock producers have been slower to seek help, although there are signs that this is changing. Fewer than 20 each of pig, dairy and beef enterprises have been accepted, but more are in the pipeline.

## FREE FEASIBILITY STUDY

The most important aspect of any scheme is the feasibility study, which either provided free or qualifies for 75 per cent grant. It can either be carried out by a specialist private consultant or by an adviser attached to an official organisation like the National Agricultural Advisory Service or one of the societies which

exist to help co-operators.

The Central Council can make use of existing organisations of this sort, but setting up a big one of its own.

## 15 PER CENT RETURN DEMANDED

The Council wants an average 15 per cent return on its investment, although the figure may be varied. Chairman Mr. Roger

by MICK

of the "Fa & S"

says, "The Council is determined to measure the usefulness of its work in strictly commercial terms."

Co-operation is not an end in itself, but must be judged in terms of its contribution to profitability and efficiency. So no project is accepted unless the Council is certain that it will be financially worth while.

Strict conditions are attached to the contracts which participating farmers sign with the Council. Each project must be financially sound.

It does not matter whether a farmer raises his money from the bank, from a seed company or from any other source, but there must be no money attached to the bank account; the members must be free to make their own decisions without other training influences.

# STRENGTH LIVES

production group every participating member must be a director; in a group the amount invested is usually to how much the group is planning to use. Always written in contract are clauses which the members to make it - many such groups in the past from poor from their members.

ere grant is provided for ngs or fixed equipment, ntracts run for five here it is only working the period is only three But whatever the time, Council keeps a watching on the enterprises for duration and insists on

## BERENDT ockbreeder"

ear reports and balance s from the directors so Council development staff be sure that all is going and give advice if ary.

## STRONGER POSITION

he extension of co-operative ming in Britain puts the rmer into an altogether nger position. To begin h he gets more inde- ndence whether he is buying lselling, and so is better le to resist the vertical egrators. Companies which ke into their own cotnrol e means of production and arketng and which, in the se of egg production for stance, have already swa- wed a big slice of the dustry.

Borrowing money for devel- pment becomes easier, for

the co-operator can put on his bank manager's desk a professional feasibility study which shows just how the capital is to be used. To a bank manager who usually has to base his lendings on past credit-worthiness, this comes as a joy.

The Council is giving a big push to business thinking in farming and is bound to change concepts of marketing.

To many people, marketing means going to market; to the modern co-operative it is an operation which begins when the Council begins management courses for the managers and directors of co-operatives, this should increase the professionalism applied to the job.

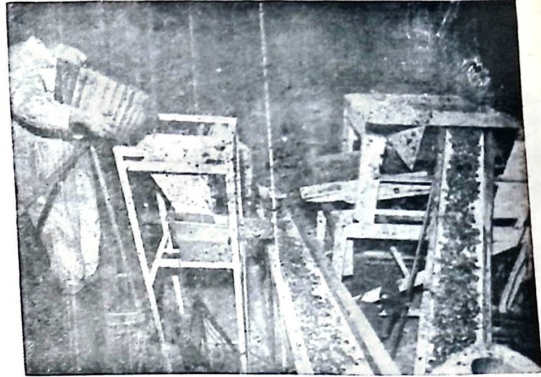
## STILL YOUNG

As the Council is still fairly young, most of the schemes it is helping are in their early stages, but among typical ones are a pilot scheme by five societies to improve the quality of beef breeding stock on hill farms, a plan by six pedigree pig breeders to produce hybrid gilts for sale, and a scheme under which five dairy farmers are pooling resources to build up a 500-cow herd.

Schemes of this sort all improve the farmers' efficiency; in return for the surrender of independence they win a new joint strength.

An organisation of this sort is ideally suited to tackling the problems that beset farmers throughout the world and particularly in the advanced countries of Europe—problems like those rising costs and shrinking incomes.

## WHERE CO — OPERATION CAN HELP



CASHEW NUT CRACKING MACHINE.

The cashew is a tough nut to crack—and to do it on a commercial scale has been one of the intractable problems to be tackled by Britain's Tropical Products Institute in London: but this machine may well prove to be a complete solution. One model has gone to QUILTON in Kerala State, India, where it has been undergoing extensive trials.

First the nuts are roasted, making the shells brittle and extracting the highly corrosive but valuable liquid. They are then fed into this simple but robust shelling machine, which works on the centrifugal principle. Shells and kernels are then separated from uncracked nuts which are returned to the cracker.

## RABBITS

Why not make money during your lax periods. An out-house, a disused garage or empty backyard can fetch you extra money from rabbits.

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# NEWS

## FARMING BRIEFS

DR. LEMU O. O. NEW VET. MAN

A Veterinary Officer in the North Western State Ministry of Natural Resources and Cooperatives, Dr. Ibrahim Lema has returned here recently at the end of his six-year course in Veterinary Medicine at Tuskegee Institute, Alabama, United States of America.

Dr. Lemu studied and obtained doctorate in Veterinary Medicine as well as B. Sc. degree in Agriculture

### ETSU NUPE ADVISES FARMERS

THE Etsu Nupe, Malam Musa Bello, has urged the farmers in his Emirate to cultivate more farms and put more effort in growing both food and cash crops so as to satisfy the need of the country.

The Etsu was recently speaking at the opening session of the two new agricultural extension offices built at Lemu and Mokwa in Bida Emirate at the cost of £500.

He urged the farmers to make best use of the opportunity given them and advised them to attend the offices regularly so as to gain more experience in the modern way of farming.

### AGRIC BOSS DEAD

THE N.A.'s Supervisor for Agriculture, Malam Shehu Sokoto, Sarkin Tudu, has been reported dead.

Born in 1916, Malam Shehu held various appointments with the Sokoto Native Authority first in 1933 as Veterinary Assistant and in 1945 he was transferred to the N.A.'s Agricultural Department as an Agricultural Assistant.

In 1952 he was promoted to the head of the department, (Agriculture), with the title of Sarkin Tunu, the post he was holding until his death.

## 'LEGALISE OGORO'

WHEN WE TALK OF IMPROVING THE ECONOMY OF THE SOUTH EASTERN STATE OF NIGERIA, WE SEEM TO LOSE SIGHT OF LITTLE THINGS WHICH COULD HELP US ACHIEVE OUR OBJECTIVE OF A PROSPEROUS STATE.

FOR INSTANCE, WHAT CAN BE THE SENSE IN LABELLING OUR LOCALLY DISTILLED GIN 'ILICIT AFTER EIGHT YEARS OF INDEPENDENCE, ASKED MR. B. B. BISOING OF IKOM.

He added "Colonialis and imperialists have a way of discouraging a people in order to extend their stay where they are unwanted by attaching a label of inferiority on whatever we do.

"Apart from seeking to perpetuate their stay in the countries upon which they force themselves, they boost the economy of their own countries by forcing their product down the throats of

the people they oppress and suppress.

Even before the routing of colonialism in this country South-Easterners had called for the legislation of our home-made gin, but to no avail.

With independence the call has been louder but still to avail. I begin to wonder whether neo-colonialism has replaced colonialism in the State, and in Nigeria as a whole.

We know as a matter of fact that exporters of spirits from abroad will frown at the manufacture of spirits in the State because it will mean their destruction"

### NIGERIANS STUDY ADVANCED AGRIC

TWO Nigerian graduates are at present in Britain studying agriculture at one of the country's leading agricultural colleges.

They are: Mr. Olusegun Famoriyo, who works at the Institute of Social and Economic Research, Ibadan University, and Mr. Bamidele Oladejo Adelana, who works at the Moor Plantations Research Station in Western State.

They are both at Wye College, the School of Agriculture and Horticulture for London University.

Mr. Famoriyo, who obtained a B. Sc. Honours degree from Durham University, north-east England, in 1966, is taking a post-graduate course at Wye's department of economics.

Mr. Adelana, a B. Sc. graduate of Ibadan University, is carrying out research studies into crop physiology with special emphasis on the growth and development of maize, peas and tropical vegetable processing crops at Wye College's 720-acre farm

## 'DONT EXPORT FOOD' ARMY CHIEF

TRADERS IN THE SOUTH-EASTERN STATE HAVE BEEN WARNED AGAINST EXPORTING GARRI TO THE CAMEROUNS REPUBLIC AND TO ANY OTHER FOREIGN COUNTRIES.

The warning was given in Calabar last week by the Calabar Sector Command of the third Marine Commando Division of the Nigerian Army.

A statement signed by the Adjutant-General, Major

Okpo, said information reaching the Army Headquarters in Calabar reveals that garri and other locally produced foodstuffs are being regularly exported to the Camerouns by canoe.

As a result, the statement points out, "there is scarcity of such food items locally and their prices have risen"

Guards at check points at the beaches have been instructed to intensify their vigilance in a bid to counte future indulgence.

### SES CO-OP BORN

A co-operative field staff union has been inaugurated in the South-Eastern State.

Addressing the inaugural meeting of the union, the Principal Assistant Registrar of Co-operative Societies in the State, Mr. T. O. Udoh, called for hard work and team spirit among co-operative field workers throughout the State.

He said hard work and team spirit were the main pre-requisites to effective organisation of co-operative societies.

The Registrar pledged the assistance of his department members of the union at all times.

The union later elected Mr. S. W. Essien, President; Mr. J. O. Edet, Treasurer; and Mr. Ini A. Usoro; General Secretary.

## SOVIET COUNTRYSIDE TODAY

DURING the period of 1965 to 1968, capital investments into agriculture in the Soviet Union increased by 41 per cent, from 14,700 million to 21,000 million a year. Today's agriculture has over 1.7 million tractors and about 580,000 grain combine harvesters.

Over the eight months of 1968, the countryside received 281,000 tractors and more than 68,000 combines.

Continue on next page

## COCOA IN SES

THE Government of the South-Eastern State has declared midnight, Thursday, 10th July 1969 as the commencement date for the 1969/70 cocoa season.

The Government has also approved Apapa as the port of shipment for the 1969/70 cocoa season.

The following producer prices which shall apply at the port of shipment have been fixed by the Military Government of the South-Eastern State for the 1969/70 cocoa season.

- (a) Cocoa Grade 1 - £150 per ton
- (b) Cocoa Grade 2 - £135 per ton

The Government has also fixed Block Buying Allowances to Licensed Buying Agents as follows:

- (a) Cocoa Grade 1 - £6 per ton
- (b) Cocoa Grade 2 £5 10/- per ton

Transport differentials between gazetted buying stations and the port of shipment in accordance with the approved marketing schemes for the 1969/70 cocoa season have also been fixed by the Government of the State.

## PALM PRODUCE JANUARY 1970

THE next palm produce buying season in the South-Eastern State begins in January 1970.

This follows immediately after the end of the present buying season in December 1967.

An announcement to this effect by the Ag. Permanent Secretary in the State Ministry of Trade & Industry, Mr. A. H. Ikwang, advised all buying agents to submit their applications before the end of the current season.

He reminded the general public that to qualify as a buying agent, a person should have a storage approved by a Produce Inspector, a scale, a bank account of at least £1,000, and a security of £1,000.

Each licenced buying agent is also expected to be able to buy at least 250 tons of palm produce.

Continued from page 6

## WORMS

satisfactory. The cost of treatment is less than 1d. per bird. If a flock is badly affected it should be treated twice, the second time 18 days after the first, - the second treatment kills any worms which may have been too young to be killed by the first treatment.

Some farmers dose all their birds which have been reared on litter, but are going into cages for laying, as a routine. Piperazine may be given in either the feed or the water, according to the maker's instructions. Either method is successful and the choice depends only on the way the maker has prepared it, (soluble or insoluble) and on the farmer's convenience.

Less easy to see, but more dangerous to chickens than the large roundworms are the hairworms, Capillaria species. There are a number of different Capillaria worms, but the farmer need not concern himself too much with difference, leaving that to the veterinary specialist. Two species live in the crop, the other two in the small intestine.

The worms are very thin and hairlike, and so difficult to see, although they may be from '25 to '75 of an inch long. The life cycle of two of the Capillaria worms is similar to that of the large roundworm. Adult worms live in bird's crop or intestine, and there they lay eggs which are passed out in the bird's droppings.

After some time the eggs develop into an infective state, and if swallowed by another bird will develop into worms. The other two species of Capillaria will not re-infect birds directly. Worm eggs passed out by the birds will only develop if eaten by earthworms. Birds are infected if they eat the infected earthworm.

Prevention of Capillaria follows exactly the same principles as for Ascaridia. Either keep the birds in cages or if they must be kept on litter, keep it dry, have a concrete floor, and disinfect thorough-

ly between batches. Capillaria are less common than Ascaridia but when they do occur can cause quite severe losses.

Piperazine, which is so effective against Ascaridia is quite useless against them. The most effectively remedy is Mintic, by I.C.I.

## OTHER WORMS

Heterakis gallinae, the caecal worm is very common, but in itself harmless. It is about half an inch long and lives only in the bird's caeca. It can be prevented by the same means as other worm but is not important enough to require treatment. It is important to turkey farmers because it carries the Blackhead disease organism, and for that reason turkeys should not be reared where there have been chickens without very thorough disinfection.

Most turkeys now are given an anti-Blackhead drug in the feed as a routine.

Finally we may mention tapeworms of chickens. All tapeworms require two alternate host animals. One type must spend part of its life cycle in a chicken, and the other part in an ant, so that chickens can only become infected through ants. Another tapeworm has snails as its alternate host.

Prevention of tapeworms is therefore very easy, just a matter of preventing access to snails and insects. However prevention is necessary as there is no good remedy.

Continued from page 7

## COCCIDIOSIS

This is particularly true with sulphadiazine and sulphamonomethoxine, and it not true of some others. Two common effective remedies are "Amprol soluble" or Saquadil".

Sub-clinical infection which means that the birds have the disease, but not badly enough for it to be easily seen, is important with coccidiosis. Growth rate is reduced and

the birds are less profitable than they should be. This especially so with broilers.

It is one of the reasons broilers grow fast in cages, and one of advantages of rearing replacement layers in cages.

Coccidiosis is often associated with other diseases, and management problems. The main reason is because the bird is weaker and less able to resist coccidiosis, but more often it is due to birds eating less food so getting less coccidiostat, and therefore not being so well protected against the disease.

Shortage of feed is an almost certain cause of coccidiosis, and lack of troughs and overcrowding can also cause Marek's disease other than known as paralysis, is very commonly associated with coccidiosis. A not possible cause is the use of home mixed rations which may be low in Vitamin A, an important vitamin for disease resistance.

Turkeys do get coccidiosis, but the species are different and cannot infect the chicken. Prevention and treatment however are the same as for chickens.

To sum up, prevention of coccidiosis depends on keeping litter dry, the floor between batches, giving the birds sufficient access to good food to keep them growing fast. If these conditions are fulfilled it should be no problem.

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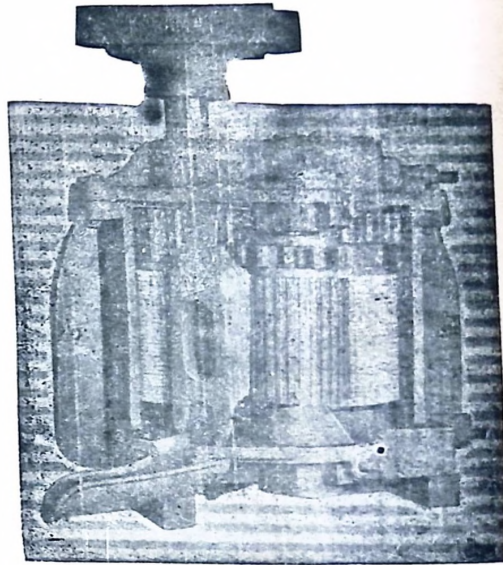
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pany'*

*It is ideal for a small business. Au enterprising  
person who instals this machine can be crushing sugar for  
customers at reasonable charges.*



TAP

**T**APEWORMS infest domestic animals either as adults in the intestine or as bladder worms outside the digestive tract. On casual examination there is little resemblance between a bladder worm and an adult tapeworm. Actually, however, a bladder worm is an incompletely developed tapeworm consisting of a fully formed head and neck.

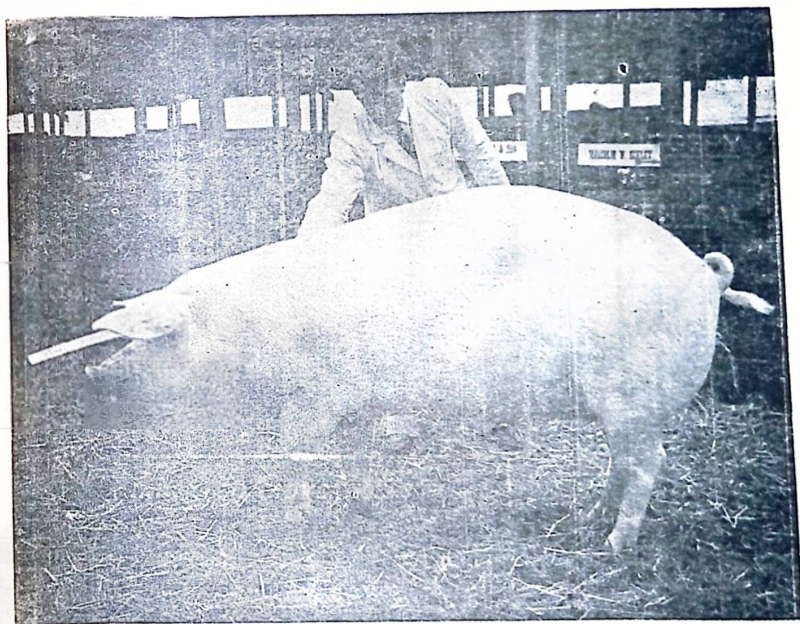
The head of the bladder worm bears four cup-shaped suckers and a double crown of hooks for the attachment of the future tapeworm to the wall of the final host's intestine. The head and neck are inverted into the thin-walled bladder at one end, the arrangement resembling the tip of a glove finger that is pushed in at the end. The inverted head and neck appear as an

opaque object in the bladder, which is filled with a clear fluid.

If a bladder worm or part of a carcass containing one or more bladder worms is eaten by an animal capable of harbouring the adult tapeworm, the head and neck of the bladder worm are turned outward in the stomach, and the wall of the bladder portion of the worm is digested on reaching the intestine, the head becomes attached to the wall by means of its suckers and hooks, and the neck begins to bud off segments, forming in the course of about 2 months a jointed, flattened, whitish worm which may attain a length of several feet. Next instalment read about the bladder worm.

# EWORMS

Continue our series on PIGS: THEIR INTERNAL PARASITE  
by courtesy of the U. S. A. I. D. — Agricultural Division



**RECORD  
HOLDER**

The Maca Marigold 6th Supreme Champion  
To breed a sow of this class 1968,  
demands a high level of  
sanitation.

**IN  
OUR  
NEXT  
ISSUE,  
READ  
ABOUT  
BLADDER  
WORM.**

# LAUGH !!!

"Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

**A**T a dinner party recently was a beautiful lady among the early arrivals. She was in a tight fitting mini with a large area of her bust bare. Her pendant on an exquisite gold chain was a supersonic liner. To a young man sitting opposite her and who had been gazing at her for sometime, she asked:

"Do you admire my aeroplane?"  
 "No please, I am particular about the airfield", he retorted.



**M**Y young brother was showing a neighbour's child our house for the first time and I heard him announce proudly as they passed the cocktail cabinet: "And this is my father's chemistry set."



**T**WO friends who had been without food throughout their journey, finally arrived, and were waiting in a cafe to be served. Presently, the waiter came

in with a dish of yam cake, one side of which was badly burnt. The waiter placed the dish on the table between them with the burnt side facing one of them.

Ayo, who was facing the burnt side of the yam cake thought for a while and then said to his friend "By the way, Olu! do you know what the scientists are trying to do now-a-days?" "No" replied Olu. "Well," said Ayo, "they are trying to turn the world upside down like this," as he said so, he demonstrated by turning the burnt side of the cake now to face his friend.

Olu stared at him, stared at the cake the burnt side of which was now facing him, then stared at him again, and asked, "By the way, Ayo, are you now a scientist?" "No" replied Ayo.

"Well! leave the blooming world where it was," said Olu, turning the cake back to its original position.

**A** BUSINESSMAN explains why Lagos men love the really short skirts worn there. "At last, men on the buses during the rush hour can get seats," he said. "The girls are afraid to sit down."



**A** PARSON was reproaching a member of his congregation for being habitually drunk. He said Kente, you know that drink is your enemy why don't you try to avoid it?" "But, parson!" replied Kente, "you have told us often enough that we should love our enemies." "Oh yes, Kente!" said the parson, "Love your enemies indeed, but do not swallow them."



**A** MAN in a booze managed to get to the door of his flat and for some time was fumbling with his key. It soon became obvious to the passers-by that he was having difficulty in opening the door.

One of them came to him and asked if he could be of help. "Yeah guy!" he said, "just hold the door to keep it steady, while I put the key into the keyhole."

## OPINION POLL

What do you think of

## FARMSTOCK?

Write to the Managing Editor, P. O. Box 79 EB, giving your ideas, suggestions or criticisms. You may thus be helping us give the public what it wants.

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WHAT ?

That a new Fishing Company starts selling soon ?

WATCH OUT

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14/8/72



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**REVOLUTION IN THE RICE PADDIES**

SEPT. '69

*At the Hiep Hoa experimental station near Saigon, a woman farmer applies fertilizer to her IR-8 rice two weeks after the seedlings were transplanted from the seed bed. See p. 7*

90W  
A/B



Sept. '69  
 Vol. I No 13  
 Price One Shilling

# FARMSTOCK

MANAGING EDITOR: Abiodun Ojugbele

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New method of preserving fish p. 12

### PIGGERY:

The pork Bladder Worm p. 16

### GENERAL:

New Equipment p. 4

The Veterinarian in a developing nation (I) pp. 10 & 11

News p. 7

Laughter p. 18

# New Equipment



## NEW CROP SPRAYING TECHNIQUE

The Micron ULVA crop sprayer, a neat low-cost battery operated machine, seen here during a recent demonstration of an improved crop spraying technique developed by a British Company in conjunction with the National Research Development Corporation. Part of a range of equipment designed to apply pesticide solutions using the new method, the ULVA should be invaluable in areas where pests and disease take a heavy toll of crops.

The technique, known as ultra-low spraying, uses very small amounts of an oil-based chemical instead of the conventional water-based solution. The method of application lies in producing uniformly fine drops which cover a much greater crop area and give better distribution more quickly and cheaply than conventional methods. The pesticide solution is applied through a "Rotary Atomiser" nozzle-rotating at about 7,000 revolutions per minute—using only a few pints per acre as opposed to about 200 gallons when using water-based solutions, at high pressure, yet achieving similar results. The chemical is supplied in ready-to-use pre-packed form, requiring no further dilution or mixing application. The container is simply screwed on to the machine, eliminating the hazard of handling the pesticide. When the spraying operation is completed the container can be removed from the machine and the remaining liquid can be used another time.

TRADE ENQUIRIES: Micron Sprays Ltd., 1-3 Phillips St. Birmingham, 6, England,

# LETTERS

## ORGANIZE 'MISS AGRIC'

Dear Editor,

From the look of things and judging from the performances of Farmstock since its debut over a year ago,

X X X X

### ADVISE ME

Dear Sir,

I, a young graduate in Agriculture from Ahmadu Bello University Zaria and now on the Managerial staff of a company will like to start poultry farming on a small scale for egg production. I will therefore be grateful if you can furnish me with the following information:

(1) News and pictures about life in your farm and probably accompanied by some old copies of your Stockbreeders monthly publications which touch the subject.

(2) Kinds of breeds and hybrid chickens proved the best and are available.

(3) Measures taken to safeguard any outbreak of disease and the type of protection given to day-old chicks till age of six weeks.

(4) How to obtain sexed chicks.

Yours Sincerely,  
E. Ade. Salako

Bacita Estate  
P.M.B. 95, Jebba.

Editor's Note:  
Read Farmstock regularly. Answers to all your enquiries can always be found in the various issues.

X X X X

### POULTRY

Sir,

I would be very grateful if you could send me the lists of books or information you have on poultry and Farm management as a whole.

the paper has come to stay. Gradually, it is becoming a handy companion to many a farmer and farming aspirants.

Women have a way of boosting a thing. My humble suggestion is for FARMSTOCK to organise a countrywide Miss Agric.

Such a contest though expensive will undoubtedly put FARMSTOCK on many more door-steps.

O. G. ILEVBARE  
DUMU.

X X X X

## MALTHUS DISPROVED AGAIN

Your July edition bore the title 'Farmers of the 2000' a survey by the Ford Motor Company of America makes very interesting reading.

The bogey of population explosion is deflated. I seriously suggest that you repeat the material sometime again and let your posters announce such an article.

It was the most interesting piece I ever read as a solution to a staggering problem.

Kano Hamma Dute  
Editor's Note  
Because of similar requests, we shall consider reprints of some previous articles whenever necessary please.

X X X X

### MANAGEMENT

I will appreciate your immediate reply.

Thanks.  
Yours Sincerely  
A. O. A. OTUDOR

P. O. Box 54  
Calabar  
Editor's Note:  
Read Farmstock regularly please.

Advertisement

# WORM INFESTATION IN POULTRY

DO YOU ALWAYS REALIZE THAT WORMS CONSTITUTE A BIG THREAT TO YOUR PROFIT MARGIN FROM POULTRY AND PIGS? HERE ARE SEVERAL WAYS IN WHICH WORMS (ASCARIDS) ADVERSELY AFFECT YOUR ANIMAL AND THEREBY DRAIN AWAY YOUR MONEY:

1. Reduced vitality and increased susceptibility to diseases like pneumonia, gastritis, and anaemia
2. Intestinal upsets such as diarrhoea or even blockage of the intestinal track by worms when present in large numbers.
3. Loss of egg production in poultry.
4. Reduced growth rate, your poultry take a longer time to reach profitable point of lay.
5. Increased mortality from worms and diseases which are aggravated by them.

You all know that when animals are healthy, they are able to withstand diseases more than when they are weak. At certain stages of the worm's life, they feed from the blood of the hosts (birds) while at other stages, they live directly on the food which their hosts have eaten.

Different stages of growth of worms are found in different parts of animals body - in liver, heart, lungs and finally adults and eggs in the intestine. In all these body organs, the worms can cause

severe damage. The havoc which worms have been causing in your poultry and pigs is now very clear.

These symptoms will help you to suspect that your poultry is infested by worms: Growth retardation, pneumonia, gastritis anaemia, reduced egg production, loss of vitality, increased mortality.

CLEAR WORMS WITH  
GLOBE PIPERAZINE  
WORMER

By using Pfizer Globe Piperazine Wormer, you can avoid the problem enumerated above. Here is how to make the wormer work:

## (a) POULTRY: 4-6 WKS

Use two spoons (1 fluid ounce) per two gallons of drinking water for one day.

## ABOVE 6 WEEKS:

Use 4 table spoons (2 fluid ounces) per 3 to 4 gallon of drinking water.  
Repeat the following day.

## (b) PIGS AND HORSES:

Use 2 table spoons per 100 lbs. body weight as a drench or mixed into palatable feed. Dose pigs just before weaning or 4 weeks prior to farrowing.

N. B. Do not give any feed or water until the medicated ones have been consumed.

Repeat the above dosage one month later in order to clear out the worms completely.

Also, remove litter after deworming so as to avoid any reinfestation. And because deworming imposes a stress on your animals, give TERRAMYCIN (Oxytetracycline hydrochloride) Soluble Powder for at least 2 days before deworming, and continue for a minimum of 3 days after this operation in order to overcome the stress.



## EGG SIZE

LIKE ALL OTHER ASPECTS OF EGG PRODUCTION EGG SIZE IS AFFECTED BY BOTH THE BREED OF THE BIRD AND WHAT HAPPENS TO IT DURING ITS LIFE, FEEDING, MANAGEMENT, AND SO ON. THE AGE OF THE BIRD IS ALSO VERY IMPORTANT. AS THE GRAPH SHOWS, ONE SET OF FIGURES ON THE GRAPH IS FOR THE THORNER 44, THE OTHER FOR THE THORNER 808.

The 808, which is a smaller bird and eats less food than the smaller egg, and thus at a general truth that smaller birds are cheaper to keep but lay smaller and less valuable eggs. Bigger birds need more food, but may lay bigger eggs (Of course it is not quite as simple as that. Some big birds may lay quite small eggs, and some very small birds like the 808 lay eggs which are surprisingly big considering the size of the bird.) One of the breeder's problems, then, is to produce birds which have the right balance of egg size to cost of keeping the bird.

It would be possible to produce birds which lay big eggs right from the start of lay, but such birds would be so big themselves, and so costly to feed that they could never make a profit. Similarly it is possible to breed a bird too small to produce saleable eggs. So breeders have to aim for a bird in between these two extremes and in fact most

produce two birds, one of the 404 type with good sized brown eggs, and one of the 808 type, with smaller white eggs and a lower production cost per dozen. Egg producers then have to choose the bird to suit their own individual requirements.

### CUSTOMER'S NEED

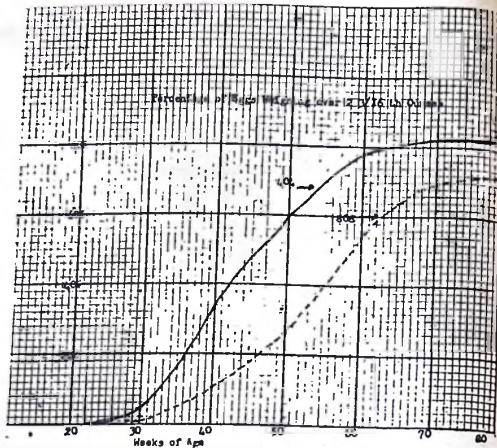
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by  
**L. J. ELSMIE**  
M. A. Cantab

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Continue on page 13

## MONTHLY ADVISORY SERIES



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# NEWS

## WEST POULTRY BOSS VISITS FARMSTOCK.

Chief E. A. Adeyemo President of the entire Poultry Farmers Association of Western State, was in Lagos recently to see off her daughter who flew to the U. S. for further studies. Chief Adeyemo took some time off from his crowded Lagos visit to call at the Office of the FARMSTOCK. He was warmly received by the Managing Editor, Abiodun Ojugebe.

## FARMING BRIEFS

### NUTRITION COURSE IN B' KEBBI

A two-day orientation course on Nutrition and Health Education for Government and Gwandu N. A. Public Health Staff opened here recently.

The Gwandu N. A. Councillor for Natural Resources and Information Alhaji Usman Maitambari Madawakin Gwandu, who spoke on behalf of the Councillor for Public Enlightenment, Health and Social Welfare, urged the participants to work hard and pay attention to what they would be taught.

The course was conducted by Malam Abdu Ladan and Malam Yahaya Pai, two Health Superintendents from the Headquarters of the North-Western State Ministry of Health and Social Welfare.

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A total number of 15,898 animals had been inoculated against various diseases in Zuru Emirate, during the period between the months of January and July this year, according to a release from the Zuru N. A. Information office.

## 'BUILD YOUR FARM MACHINERY' - UN EXPERT

DEVELOPING COUNTRIES SHOULD MANUFACTURE MORE OF THEIR OWN FARM MACHINERY AND IMPLEMENTS TO INCREASE AGRICULTURAL OUTPUT, A UNITED NATIONS EXPERT GROUP HAS RECOMMENDED.

THE GROUP, CONVENED BY THE U. N. INDUSTRIAL DEVELOPMENT ORGANIZATION (UNIDO), MET RECENTLY IN VIENNA AS PART OF UNIDO'S EFFORTS TO HELP DEVELOPING COUNTRIES IDENTIFY INDUSTRIES THAT COULD BE BUILT UP.

The experts said developing countries should step up activity in the "total manufacturing sector" of farm machinery adaptation, design development, manufacture, and repair and maintenance. They said it was "urgent" that UNIDO prepare guide-

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## EXPORT BOSS AT NAIROBI CONFAB

Sir Arthur Smith, Chairman of the British National Export Council's African Committee, is to visit the annual Nairobi show September 30 - October 4 where, with two members of his committee, he will welcome buyers from all over Africa to the British Pavilion. Many of these buyers will be brought into Kenya specially for the occasion. They will come from Burundi, the Congo, Ethiopia, Malawi, Ruanda, Somalia, the Sudan, Tanzania, Uganda and Zambia.

The 20 British companies taking part in this year's show will make up the largest-ever British exhibition of agricultural machinery and livestock to be shown in Kenya. Over 50,000 visitors are expected to see the British Pavilion, which is being sponsored by the British Agricultural Export Council.

Shortly after the show, BNEC Africa is arranging for ten Nigerians to visit

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Sir Arthur Smith

## NIGERIA JOINS RICE CONFAB

The West African Rice Development Conference which sat recently in Monrovia, has paved the way for the creation of a new regional association of African rice growing nations.

Delegates from 14 countries, including Nigeria, prepared the draft constitution of what would be known as the West Africa Rice Development Association.

When approved by the potential member states, the association would become the world's first regional body specifically charged with seeking solutions to problems concerning the production and marketing of rice.

The United Nations Food and Agricultural Organization has offered its West African Regional Headquarters in Accra as the site for the association and the U. N. Development programme has agreed to provide the necessary financial assistance, with a contribution from the United States.

Central to the objective of the association will be the creation of a research unit in West Africa which will seek ways and means to increase rice production in the region, while improving existing distribution methods.

Named to the Advisory Committee were six West African nations - Ivory Coast, Liberia, Mali, Nigeria, Senegal, and Sierra Leone. Four non-African nations - the United States, the United Kingdom, France and the Netherlands - also are members, together with their specialized agencies of the United Nations and American private organizations - the Ford and Rockefeller Foundations.

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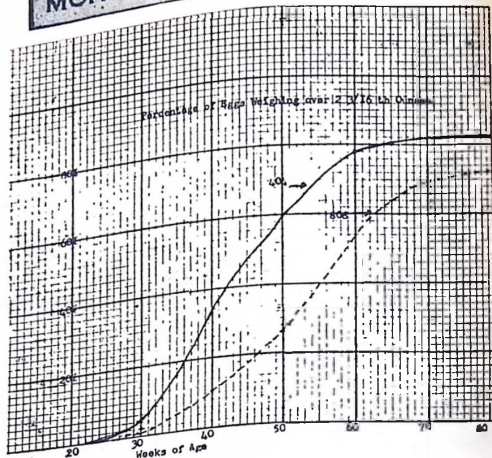
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Sir Arthur Smith

# FIGHTING BIRDS & LOCUSTS WITH RADAR

**D**R. GLEN SCHAEFER, PROFESSORIAL RESEARCH FELLOW AT LOUGHBOROUGH UNIVERSITY OF TECHNOLOGY IN THE NORTH OF ENGLAND, HAS DEVELOPED A RADAR TECHNIQUE THAT COULD BE A POWERFUL WEAPON BOTH IN THE BATTLE AGAINST LOCUSTS AND IN THE STRUGGLE TO REDUCE, OR EVEN ELIMINATE, DAMAGE TO AIRCRAFT BY BIRDS.

by **TONY OSMAN,**

London Science Writer in an interview with Dr. Glen Schaefer

fied only on the rare occasions when moonlight, for example, makes them visible. However, it had been known for some time that flocks of birds, at least, would give radar-reflections indeed there is now a well-developed field

of study called radar ornithology. Dr. Schaefer decided to see how he could use radar in his studies.

He bought an ex army radar for £100, and installed it in a field near his home to the south of Leicester; the

*Collisions between birds flying in the vicinity of airfields and aircraft rarely end in tragedy but they do cause damage.*

*In Britain the damage to military aircraft is estimated at £1-million annually. Now Dr. Glen Schaefer, a Research Fellow at Loughborough University of Technology, has developed a radar technique which he feels will reduce - even eliminate - this danger. Dr. Schaefer, whose hobby is birdwatching, asserts that his radar technique could also be a powerful weapon in the battle against locusts.*

He was always interested in nature and birdwatching for, as a boy, he lived in the wild countryside near Toronto, Canada.

After graduation, he did research in mathematics, particularly mathematical physics, and eventually went to Britain to work for English Electric (now merged into the General Electric and English Electric Companies Ltd) on the development of a nuclear power plant.

But he did not lose his interest in birdwatching. Rather it developed into a particular interest in bird migration. Eventually he left his job as a physicist to concentrate on birdwatching.

### Identification Difficulties

Since many birds migrate at night they can be identi-



Dr. Glen Schaefer (left), Professorial Research Fellow at Loughborough University of Technology in the north of England, and Mr. Jeremy Roffey, an entomologist with the Anti-Locust Research Centre in London, are seen here with some desert locusts which were released over an English airfield as part of a test in tracking locusts with radar. Both men were members of an expedition to the Sahara where a pilot experiment was conducted in the tracking of solitary locusts

beat pattern of the bird. If its characteristic flight was one in which gliding alternated with active flight the radar trace would show horizontal marks interspersed with the zig-zag patterns. Dr. Schaefer noticed that each species had its characteristic wingbeat pattern.

Though this was unexpected, it was easy to understand. The rate at which a bird flaps its wings is governed by such factors as its mass, the moment of inertia of its body and the size of its wings.

The rate is decided by, for example, its musculature and its skeletal construction and a migrant's flight is so economical in energy that its flight muscles must be "tuned" to act with the highest possible efficiency.

These factors combine to give a wingbeat pattern that is constant to within ten per cent, for any particular species. Dr. Schaefer verified this by photographing 45 different species of migrants in flight.

It is difficult to understand how the characteristic wingbeat pattern of a species can be detected by radar which, in animals, is mainly reflected by fluids; the wings of birds contain very little fluid.

It is possible, but very unlikely, that Schaefer's patterns represent radar reflections from the actual wings. They might alternatively represent a slight alteration

*Continue on next page*

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Royal Aircraft Establishment lent him a generator to power it. Originally designed for anti-aircraft use, the radar could follow a "target", such as a flight of birds, automatically.

He found that he could manipulate the circuits of his radar set so as to identify species of birds.

### Zig-Zag Pattern

The echoes recorded on his radar showed a regular zig-zag pattern of intensity. Dr. Schaefer realised that this was the actual wing-

Continued from page 8

## RADAR

In attitude occurring with each beat of the wings - the reaction from the beats is bound to affect slightly the way that the bird is pointing and radar could pick this up.

### Variation Too Small

However, observations show that this variation is too small - it could account for only a one percent, change in the intensity of the echo. The most likely explanation involves the large peccoral muscles that move the wings.

As these move, the body becomes noticeably different in shape - rounder as the muscles swell. This change would alter the intensity of the radar echo and almost certainly this is the mechanism that gives rise to the observed wingbeat pattern.

Whatever the reason for the identification, it is invaluable both for scientists studying migration and for those concerned with protecting aircraft from bird damage. Though collisions between aircraft and birds only rarely cause serious damage, there are roughly two such "strikes" every week at London's Heathrow Airport.

It is estimated to cost £150,000 per year to repair the damage. Military aircraft, which fly lower and faster, sustain about a £1 million worth of damage in Britain each year.

Dr. Schaefer is sure that his technique can easily be used to monitor an air-field for birds likely to endanger aircraft and, incidentally, can be used to provide information needed by those trying to decide where to establish London's third airport.

### Tracking Locust Swarms

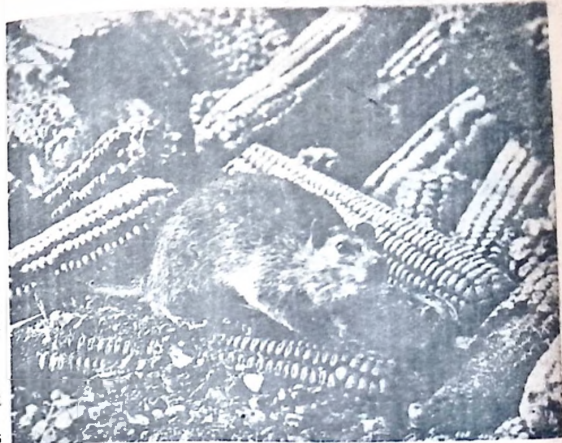
His application of the technique in the battle against locusts is more recent. Last year (1968) he mounted a marine radar set on a Landrover and took it to North Africa. He was

## Is the end of rat nigh?

The rat is undoubtedly man's most elusive pest. For decades incessant wars to exterminate this wily creature have failed. Usually the rat population seems to yield or succumb to a new attack to wipe it off. But as more and more doses are applied, this seemingly defenceless creature develops an immunity to the bewilderment of its attackers.

Once the immunity is known, the attack lessens and young rats, stronger and more ravenous than their forebears soon flood any locality. But the war goes on.

A new approach to the rate problem is undergoing



more tests to confirm the claims of its inventor. The trick is to inject some male rats with a serum which renders them semi-impotent. These half-impotent

(or sterile) rats are able to mate with female rats and cause false conception.

The female behaves as if

Continued from page 17

was pleasantly surprised when he picked out solitary locusts up to two miles (three kilometres) away, and swarms at distances of up to 30 miles (48 kilometres).

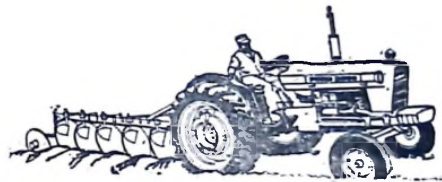
He could distinguish between male and female locusts and between the relatively harmless solitary locust and the gregarious ones - the wingbeat patterns presumably vary because the different kinds have different sizes and masses.

Dr. Schaefer's results with locusts, like those with birds, are valuable both to the academic community and those who must deal immediately with the pests.

*The solitary locust is known to fly at night; and it is known that, in some way, large groups form, adapt to group life, and turn into the recognisably different gregarious type that menaces crops in Africa.*

Continue on page 17

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See page 14 for Rates. Advertisements should reach us a month before the date of publication.

# THE VETERINARIAN DEVELOPING NATION

To the illiterate and uninformed intellectual, a veterinarian is nothing more than "dog doctor" or "cow doctor."

*The health of a nation is the wealth of that nation. In this age when every nation tries to stand on its own, any factor that has adverse effect on the health of a nation will greatly hamper all its activities nationally and internationally. Health itself is quite a wide field which not only depends on the human population but also on the animal population.*

Gone are the days when man was thought of as a being quite apart from the rest of the animal kingdom especially now when we remember the great plague that hit Europe in the last century and when in particular we remember the influenza epidemic that swept through Nigeria just over a decade ago - when dear ones lost their lives and the nations manpower suffered a colossal reversal.

A man is not healthy by the amount of drugs given him in hospitals. All the drugs do is to act as second class defence against the millions of infective micro-organisms that share the world with man.

Nature has so built the human body that it can resist infection, however the human body is like a machine which needs constant service to combat the effects of wear and tear. Man must supply his systems with source of energy to combat the natural process of senescence.

It is not just that man must eat food, but he must eat good food; in short he needs a balanced diet. It has been said that people die not due to lack of nutrition but from malnutrition. It is not just the amount of grain and chaff one

pumps into the stomach that matters, but the quality of the food. Even now the amount that we seem to be happy about seems to be diminishing at such a fast rate because in the population - food production race, population is having the gold medal.

### FOOD PROBLEM

Statistics show that the world population is increasing at the

by 'WALE TOMORI

Faculty of Veterinary Medicine Ahmadu Bello University, Zaria.

rate of 132/min or 190,000 a day which is equal to 69 million a year that is a new Nigeria (55 millions) every 9 months 15 days. Yet the corn, yam, rice are still taking the same time to grow to maturity, and the land become scarce. This is then the grim state of world food problem. Attempts are being made to get food from any available source even from petroleum.

Nigeria can certainly not afford to convert its petroleum to food now, but there is something we can safely explore and exploit to our advantage - OUR LIVESTOCK. Nigeria with an area of 37,000 sq. miles had up to 7 million heads of cattle, twice the number of goat and about 4 million sheep and some 220,000 pigs. 10 years ago (1959 F.A.O.)

Nigeria is really rich in livestock, however 9/10th are in the savannah and guinea-savannah zones of the Northern parts of the country where most of the herdsmen are nomadic and have to trek hundreds of miles in search of food and market with the result that the best of our livestock that should go to improve the health of our peoples goes to provide energy for the great trek these animals have to take.

Thereby, the animals become breeding sites for diseases such as rinderpest, foot and mouth diseases, anthrax etc. which always on the wake of the sick and emaciated cattle before they get to the market.

Any wonder Nigeria had pay £3,500,000 for milk and milk products in 1964.

It is significant that even politicians of those days realise

the importance of animal production to the health of a nation.

The Minister of Agriculture in one of the old regions of Nigeria gave his forward to the annual report of Veterinary division of his ministry said "During the past year (1960) there was great increase in both number and centres for poultry production.

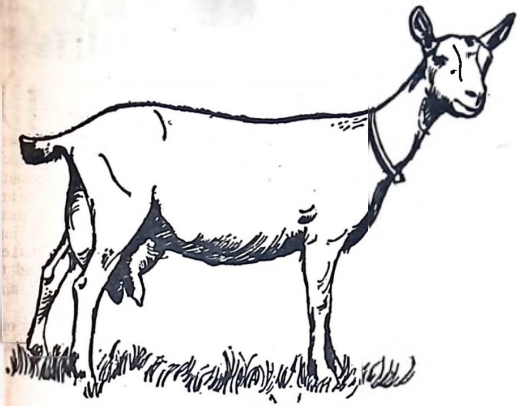
Poultry expansion occurs all over and each month over 20 million chicks were distributed by the Ministry Hatcheries and by exportation from overseas. THIS HAS NOT SATISFIED DEMAND. It seems the people have suddenly realised the economic potentiality of poultry as livestock as a source of much needed animal proteins and equally needed profit."

### DISEASES

The importance of livestock cannot be over emphasised particularly when we realise today that many more people are succumbing to diseases which are still mysteries to hospitals and clinics.

In our villages and hamlets where there is freedom of movement between goats and sheep in and out of our villages one cannot but help trace the high rate of mortality to zoonoses, diseases which are transmissible between man and

# IAN IN A



A good source of milk that has not been considered at all

imal; such diseases include B. tuberculosis, rabies, anthrax, taeniasis to mention a few. These diseases not only play a mighty role in reducing our population, but also lower our productivity and aggravates the shortage of animal proteins which are most essential for the maintenance of our health, thus saving the human population, and making very easily susceptible to other diseases which do not come from the animals. So a vicious cycle of hunger, sickness, disease is set up which keeps the nation no good.

Nowadays many more people in big cities live to-old age and the world is left with many more mouths to feed from a source which is fast dwindling. Herein comes the Veterinarian, the vet, by his training which demands such a diversity of qualifications must not only maintain the livestock in his country but also increase its productivity.

## PROBLEMS

The veterinarian in Nigeria runs into many problems which many other developed countries have tackled and overcome, but he is also exposed to many problems pertaining to Nigeria and Nigerians. First just as the human beings need food, so do the livestock need food

and here is Nigerian's problem. The feed for the livestock is hard to come by, hence our herdsmen have to travel miles to get feed for his livestock. Nigeria is "blessed" with a host of insects which act as vectors for most of the devastating diseases common to livestock.

One of them is the tsetse fly the vector for the organism causing trypanosomiasis. This disease leaves our livestock weak, lean and emaciated making it worst prepared for other diseases. Another problem is that most of the herdsmen are nomadic, moving from place to place, changing environment to which many may be early adaptable, but to which the animal is least adaptable. This is a social problem. Tracing it to its root, one finds that the herdsman only moves to areas where he can get food the whole year round, then he himself finds it unnecessary to move about.

## CO-OPERATION

Hence, it is necessary that our agriculturists and scientists must work hand in hand to grow and produce high quality feed stuff all over the whole land. This is a great task which must be done if we ever hope to improve the

lot of our people. Aims are not achieved unless efforts are made to achieve them.

With the livestock settled, the Veterinarian can now concentrate on keeping the animals healthy and free from infection. He can now dream of producing high efficiency cows with high birth-rates, and he can now attempt to improve breeds by the latest scientific methods such as artificial insemination.

Producing highly efficient livestock is not the end of the process of bringing excellent protein to the populace. Meat inspection is a most important aspect of man and animal health which the Nigerian government has placed in the hands of the people least competent to do so.

It is ridiculous to expect officials of the ministries of health to know which meat is fit for human consumption. It is not a surprise that our abattoirs are more like refuse-dumps, the meeting place for the world assembly of flies. It is most disheartening that the only University in West Africa that offers a full-time course in Veterinary Medicine receives its meat supply from the most appalling

abattoir where the vultures and flies time for killing cows.

Even if the Veterinarian done his possible bring the most suitable to the abattoirs, these age-old disease reduce his work to 2

## MEAT INSPECTION

Excellent and efficient meat inspection by highly skilled professional has an important role in disease prevention, disease control. With improved stock and greater increase in number of livestock Nigerian meat must be thoroughly inspected to gain acceptance for it in neighbouring African countries. It is only then that the consumer is assured of wholesomeness, freedom from diseases and cleanness of meat and meat products.

## MILK

This brings attention to the role milk and milk products can play in the health and economy of a nation especially Nigeria.

Milk contains almost all the types of foodstuffs, carbohydrates, fats, protein etc. and this makes them good breeding ground for organisms which

Continue on page 13

## RABBITS

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# BANANAS & CITRUS ARE NOT ONLY TROPICAL FRUITS

Says Bridget Smith

Bananas, citrus avocado, mango and pineapple almost every developing country in the tropics or sub-tropics produces at least one of these fruits or range of many others.

They are crops of great potential value but, in many countries, the wrong varieties are grown, storage is inadequate, and the possibilities of exporting fruit have never been fully explored.

The Tropical Products Institute in London, which has done much to help developing countries obtain most benefit from their agricultural products, is aiming to help the fruit producers by organising an international conference this year (1969) which will bring together all sides of the industry.

Dr. G. B. Pickering, head of the Institute's Scientific said, "Our first large-scale international conference was on the oil palm and two years ago we held a conference on essential oils production in developing coun-

tries. Both of these brought together growers in the producing countries, industrial processors, and the scientific technical and economic experts including the Institutes own specialists.

All who participated were very enthusiastic and there useful and constructive discussions which we think were of particular benefit to the delegates from the developing world. We hope that the fruits conferences will be equally successful."

## Wide Discussions

The meeting will be held in London from September 15 to 19 and, as well as dealing with specific fruits,

papers will discuss topics such as problems of establishing processing industries in developing countries; shipping, containerisation and modern developments in packaging; controlled atmosphere storage of fruits; processing less familiar fruits;

the role of air freighting in the international trade; chilling injury in tropical fruits; pathological problems of fruit transport and storage; modern developments in biocides for use on fruits;

physiology of tropical fruits; design of fruits stores, organisation of international fruit trade.

Dr. D. G. Coursey, organising secretary of the conference, is head of the Tropical Products Institute's Fruit and Vegetable section.

He has already visited the Caribbean twice in connection with work on root crops and has been invited by the University of the West

Indies to spend two months in Trinidad early this year to continue this work.

He is hoping for very full participation in the conference by developing countries, both those which have considerable experience of fruit production and those which are still producing little more than for local markets.

"Many West Indian Islands,"

he said recently "know as much as anyone about banana production and some citrus fruits but there are other tropical fruits which are grown only on a small scale. The conference should give agriculturalists from the Caribbean the opportunity to learn from others with considerable experience of the production, processing and export of less common fruits."

## Fishing

### New method for preserving fish under trial

Gradually Nigeria is becoming a fish market. With this economic progress are some attendant undertones of possible loss of profit which is the driving incentive in a trade.

As more fish come into the market, not all is likely to be quickly absorbed. One is at once faced with the problem of preservation particularly in areas where facilities of cold rooms are not enough, uneconomical or absent.

Even along the coast or in big towns where such facilities abound the continuous supply of new catches poses the question of either preserving the unfinished supply or disposing of the lot by other means. A new method, simple and inexpensive, has been announced in Sweden.

#### SIMPLE APPARATUS

The process which does not call for any elaborate apparatus is termed ENSILING. A release by the

Micro-biological Institute at Ultuna Agricultural College announcing the new Technique called the process - The prevention of Clostridium Botulinum type E / poisoning and Fat Rancidity by Silage Fermentation. A film to aid mass education has also been prepared.

What is the process? It consists of mixing fresh fish ground and mixed with starch (20%) plus other compounds. The paste is then kept in a silo. It is revealed that bacteria from storch sets off a rapid flow of lactic-acid fermentation. This product is the preservative. Fish on which it has been smeared have remained fresh and edible for about three months.

#### BOON

This process is a boon to our fish dealers. The other process of disposing of unsold fresh fish is by converting the surplus into fish meal.

Continue on page 17

A wise person

learns everyday

READ

FARMSTOCK

ALWAYS

Continued from page 6

## EGG SIZE

hand some farmers find it easier to sell a less proportion of big eggs, but more smaller ones at a less price.

They will prefer to use a smaller type of bird such as the 808 or one of its competitors.

Quite a number of factors can affect egg size of particular lots of birds apart from their breeding. One of the most important is temperature. The higher the air temperature in the poultry house the smaller the eggs.

For this reason eggs from any strain of bird are smaller in West Africa than in Europe

Nothing can be done about the climate, but it is important to be sure that the poultry house is no hotter than it need be, by providing plenty of ventilation.

Numerous diseases have a bad effect on egg size. The worst of these are probably worms and coccidiosis, which damage the bird's digestive system, and prevent it using its feed properly. The damage from a bad outbreak of either disease can reduce egg size right through the rest of its life.

Other severe diseases, such as aspergillus can be equally damaging, and every precaution should be taken against them.

### IMPORTANCE OF FEED

Feed makes quite a difference to egg size too. Obviously badly balanced feed will reduce egg size as well as

all its other bad results, but there is no need to say more about that here since Farmstock readers undoubtedly know the importance of providing a well balanced ration for their birds already.

Some difference to egg size can be made by using good commercial rations on general sale. The principle is that anything which increases the intake of nutrients improves egg size. Special high nutrient density rations for small birds like the 803 or Hyline improve their egg size quite usefully.

Such rations are not normally recommended for larger birds, but can be used to increase egg size in some few cases of difficulty, perhaps only for a limited time.

A more generally useful way of improving egg size is by feeding pellets instead of meal.

It is true that pellets cost a few shillings a ton more to buy, but commonly the difference is balanced by reduced wastage, so that the better egg size is more or less a bonus. It is always necessary to be careful in changing from meal to pellets.

They should be introduced slowly so that the birds get used to them, and one needs to watch that the pellets are not too big for the birds to eat. Once it is certain that all the birds are eating pellets freely the whole of the feed can be given in that form. The same precautions should be taken when changing back from pellets to meal, though the change is normally less troublesome in that direction.

## ONLY PROBLEM

There is one problem with all-pellet feeding, and that is the increased risk of feather picking, particularly with

White Leghorn type birds, but this can be overcome in the usual ways. For medium hybrids pellet feeding in the early part of lay is a very useful way of increasing egg size more rapidly than would otherwise be the case.

In the later stages of lay when production is getting less, and the eggs are mostly a good size anyway, the birds can be changed back to meal. At this time of life the birds will often overeat and grow fat so that the change back to meal will help to prevent them doing so, and reduce costs.

This two stage feeding plan is becoming fairly popular in Britain now, and gives farmers the benefit of a better egg size early in lay, while keeping costs down in the second part of the laying year.

Continued from page 11

## THE VETERINARIAN

cause such diseases as tuberculosis and brucellosis etc.

### AGENTS WANTED

Intelligent and reliable persons wanted all over the Federation to sell in good commission and terms:

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This milk can either be infected due to poor handling or these organisms may be present in the animals producing the milk - so the importance of a healthy animal cannot be over emphasized here. As Nigerian come to realise the important role good milk can play in their health problems, more high milk producing cows will have to be raised and the numbers we have will have to be maintained and increased.

Unfortunately the local breeds like the Zebu, the Shuwa Arab, the Sokoto Gudali etc. are not prolific milk producers; research experiments in hybridization and upgrading of the local breeds have to be pursued vigorously and we need highly efficient and qualified Veterinarians in this field.

The idea that Nigerians are not milk drinkers is one which has not stood the test of time. Says Mr. LaBeach, Managing Director of Foremost Dairies Ltd Makers of Samco Milk Products.

"In 1962 when I first came to Nigeria, 85% of our business was going to the expatriates, now (1967) seventy per cent go to Nigerians", the words of a man who is in a business with a public interest.

Everybody likes a drink of cold chocolate milk and a package of ice cream for the evening dessert, however until we can stop importing every little bit of raw material, we can only like them but only few can taste them.

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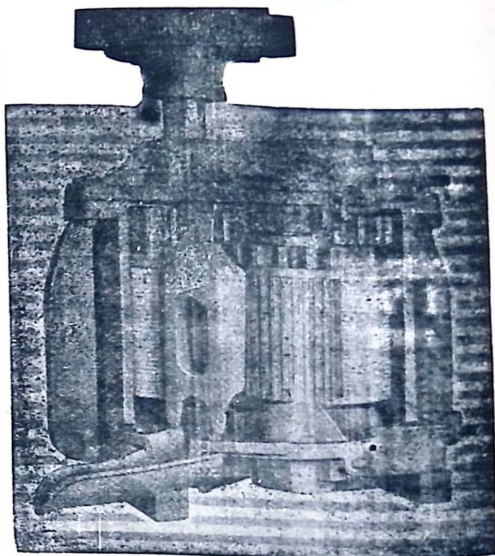
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the pork

# BLADDER WORM

— by A Correspondent

The tapeworm, *Taenia solium*, infests pigs in the immature or bladder-worm stage. The full-grown, or adult, tapeworm, known as the pork tapeworm, infests human beings. The bladder-worm stage is spherical to lemon-shaped and from one-fifth to two-fifths of an inch in maximum diameter.

The pork bladder worm lodges in the muscles of pigs especially the muscles of the abdomen, the muscular portion of the diaphragm, the loin muscles, the heart, the muscles used in chewing, the tongue, the muscles between the ribs, certain muscles of the hind legs, and shoulder muscles. It has been found also in the brain, eyes, liver, lungs, pancreas, and spleen.

**Life history**—When a human being swallows a live pork bladder worm with raw or incompletely cooked pork the combined action of the digestive fluid and the warmth of the stomach nauseates the head and the neck of the worm to be pushed out, leaving the

shrunken bladder behind the neck; the wall of the bladder is digested.

On reaching the small intestine, the parasite attaches itself to the intestinal wall by means of its suckers and hooks and develops, in the course of about two months, into a gravid (eggs-producing) tapeworm.

The tapeworm may attain a length of 3 to 6 feet, the longest joints in the tail end being about half an inch long and one-third of an inch wide. The joints or segments at the tail end become detached from the tapeworm chain and are expelled with the excreta, new segments taking their place by growth in the region of the neck.

The detached segments expelled with the excreta contain numerous eggs which are liberated as the segments disintegrate. Pigs become infested as a result of swallowing the tapeworm eggs or entire segments, each containing hundreds of eggs.

On getting into the pig's digestive canal, the

eggs hatch and the young worms, which escape from the eggshells, bore into the wall of the digestive canal and are carried by the blood stream, aided probably by their own migrations, to various parts of the animal's body.

**DAMAGE**—No definite symptoms are associated with bladderworm infestation of swine. Infestation is diagnosed, as a rule, after death upon the discovery of the worms in the muscles and other places. Pork infested with bladder worms is commonly known as mealy pork.

Because of the danger to human health from eating raw or imperfectly cooked mealy pork, special precautions are taken to detect these parasites in swine carcasses under Federal State, and local meat inspection. Lightly infested carcasses are passed for human food only after sterilization, following the removal of visible cysts; if the infestation is excessive the carcass is condemned and not used for food.

**TREATMENT**—There

is no known practical treatment for the removal of bladder worms from swine.

**PREVENTION**—Infestation can be prevented by a sound system of rural sanitation. Pigs become infested only as a result of swallowing tapeworm segments or eggs with feed and water that have become contaminated with human excreta or by rooting in contaminated soil. Proper disposal of human excreta will prevent contamination of areas to which swine have access. As the tapeworm cysts become rarer in swine the adult tapeworm also becomes rarer in man; thus the vicious cycle of the parasite is gradually destroyed.

It is found in swine only where the level of human sanitation is still far below accepted standards. The pork tapeworm is also capable of developing to the bladder worm stage in human beings, the bladder worm lodging in the eye and brain as well as in the muscles.

Continue on page 17

Continued from page 9

**RAT**

she is pregnant and is avoided by other males, soon the 'pregnancy' aborts. The 'impotent' rat is usually more active than the potent, so it causes another false pregnancy.

In effect, if more and more of the 'impotent' male rats are let loose in a locality, their females will stop reproduction and soon the whole lot will die away. This system may prove to be man's all time blow against the ubiquitous rat.

— A Correspondent

Continued from page 12

**FISH**

This avenue is an absolute virgin business line in this country in which poultry and animal husbandry are gradually becoming business pursuits.

Fish is the only source of flesh that satisfies all religious doctrines; as such its marketing is extensive, so too is the catching. The only handicap is putrefaction if it is to be sold fresh. Since many people far away from the coast relish fresh fish, this Swedish invention will go a long way in solving a long-felt need.

— A Special Correspondent

Continued from page 16

**BLADDER WORMS**

When bladder worms lodge in the human brain they may produce epilepsy.

It is highly important, therefore, to prevent this dangerous human infestation by a rigid adherence to sanitary disposal of human excreta on farms and in rural communities. Proper sanitation will remove the danger of infecting human beings as well as pigs.

Continued from page 9

**RADAR**

The fact that solitary locusts can be tracked and followed as they change their style of life may solve many mysteries connected with the transformation.

Dr. Schaefer is convinced that his research can help in identifying and destroying locust swarms before they can cause damage. He has shown that a relatively cheap (£1,000) radar can detect these swarms, and pinpoint their density. Furthermore, it can direct aircraft carrying insecticides to the swarms.

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**WHAT IS****IN AN****EGG ?****READ ALL****ABOUT IT IN****OUR OCTOBER****ISSUE**

# LAUGH !!!

"Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

*Carpenter wants an ugly girl who no longer pursues criminal activities but hard to deal with.*

*One man woke up one early morning and started shouting:*

*"We live in a society, systematically planned to make everyone work too hard, because he is for ever discovering that he needs too much, on account of the commitments which leave him too little."*

*A disease is threatening to attack public administration. Monkey, the work, baboon de chop. I good so?*

*A man dashed into a chemist shop and asked the proprietor how to stop hiccupps. The answer was a hard slap in the man's face.*

*The man was furious and demanded the reason. "Well", said the chemist, with a smile, "you're not hiccupping now, are you?"*

*The trouble is that people practise economy when they broke, instead of when they have cash in hand.*

*One man recently claimed that he was the master of the house.*

*This claim landed he husband and wife in court.*

*A group of surplus girls stormed the office of a local marriage registry and wanted to know why they have no husbands.*

*A teacher, on receiving her pay envelope and after extracting the money held the envelope up for the class to see.*

*"What is this?" she asked, by way of a general knowledge test.*

*"A pay envelope, miss, said one boy.*

*"And what did it contain?" she went on.*

*"Your salary",*

*"That's correct" replied the teacher. "And now has anyone any questions to ask?"*

*Please, teacher, "said a little boy who had been studying the envelope in silence, "what do you do?"*

*BURGLARY, one man confessed is made to look so admirable, honourable and easy that I was tempted to crack a safe on my way home.*

*In classroom discussion a boy stood up to say: grandma was a girl, she didn't do the things girls do today. But then she didn't do the things grandmas do today, either.*

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### OPINION POLL

What do you think of

### FARMSTOCK?

Write to the Managing Editor, P. O. Box 79 EB, giving your ideas, suggestions or criticisms. You may thus be helping us give the public what it wants.

## HAVE YOU HEARD ?

## WHAT ?

## That a new Fishing Company

## starts selling soon ?

## WATCH OUT

# FARMSTOCK

In this edition

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The vet. in a developing  
nation pp. 10 & 11

**OCT. '69**

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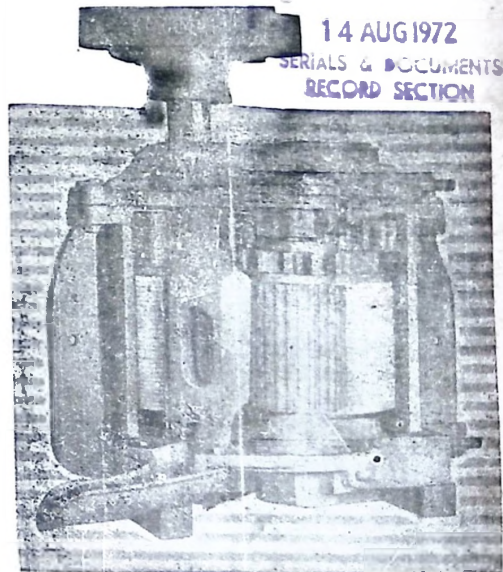
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# FARMSTOCK

MANAGING EDITOR: ABIODUN OJUGBELE

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# OPINION

## YOUTHS & FARMING

Only the hypocrite will not admit that all over this country now, there is a gradual and steady movement to farming. Time there was when a slogan or two did nothing to push the people 'back to the land' but fortunately nowadays, economic circumstances, though hard to admit, are making more and more to realize that the land has an answer for their headaches and business impasse.

There was the timber rush when all the able bodied strove to become a timber merchant, clerks and technicians abandoned their offices and work-desks for the bush, until the glut sent back the flotsam and jetsam of that craze scrambling for other ventures.

So, too was the import and export mania.

It was not until the attention of the Government was drawn to the various malpractices that drastic measures were undertaken resulting in mass exit of many an 'export manager' from that line. And there were scores.

But youths are always coming, the toddlers of today are the youths of tomorrow. Before they grope into blind alleys the country will benefit immensely by attracting them into farming.

Continued on page 7

# TOUGH AND RUGGED!

# EVEREST

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## MONTHLY ADVISORY SERIES

**BODYWEIGHT AND EGG PRODUCTION.**

**T**HAT THERE IS AN IMPORTANT CONNECTION BETWEEN THE BODYWEIGHT OF LAYING BIRDS AND THEIR EGG PRODUCTION IS WELL KNOWN. THERE ARE TWO ASPECTS TO THIS CONNECTION, GENETIC, AND ENVIRONMENTAL. ON THE GENETIC SIDE SELECTION OF BIRDS TO GROW RAPIDLY WILL ALSO LOWER THE EGG PRODUCTION OF THE STRAIN.

BROILER BREEDERS GIVE A PRACTICAL DEMONSTRATION OF THIS EFFECT. SELECTED FOR FAST GROWTH RATE THEY LAY ONLY ABOUT HALF AS MANY EGGS AS ONE OF THE MUCH LIGHTER STRAINS USED FOR EGG PRODUCTION.

ON THE ENVIRONMENTAL SIDE BIRDS WHICH ARE TOO SMALL, DUE TO POOR FEEDING, DISEASE, OR SOME OTHER PROBLEM WILL NOT LAY WELL, AND ON THE OTHER HAND SOME BIRDS, SUCH AS BROILER BREEDERS, MAY GROW TOO FAT TO LAY WELL, UNLESS THE FEEDING IS RESTRICTED.

A recent paper in 'Poultry Science' by Nordskog and Briggs gives a lot of useful information on the relationship between bodyweight and egg production in laying strains of chickens. These scientists studied the result of the Iowa Multiple Unit Poultry Test for a period of four years. This Test is a comparison between the different strains of layers, most of them White Leghorn type Hybrids which are on sale in Iowa.

The principal reason for the test is to make a comparison between the different strains so that farmers buying day old chicks will have information on which to decide the type of bird which will best suit their needs. Sixteen strains of birds were tested in each of the four years studied by Nordskog and Briggs.

All sixteen strains were tested on each of a number of farms, sixteen farms in the first two years and twenty farms in the second two years. Each farm had four pens of each strain, making a total of 64 pens per farm.

All the birds on each farm were hatched at the same time and fed and managed

in the same way, so that the comparison between strains could be fair. There were, of course, differences between the farms in the Test, some were better managed and the birds performed better, others had troubles of one kind and another. The test was run on so many farms to make sure that the comparison between strains was fair.

If it had only been on one farm there might have been some thing on the farm which helped or hindered one strain, and so the results could have been misleading, and farmers would have bought the wrong sort of birds in consequence. Because the Test was run on so many farms it was possible to get from it not only information about the strains, but about the effect of bodyweight on egg production as both an environmental and a genetic effect.

production, mortality, and egg weight. There would have been one on food consumption too but that was not recorded in this report.

Nordskog and Briggs have shown how these characteristics vary with changes in point of lay bodyweight. Their results, summarised in Table 1, see p. 7 are presented in the form of a "regression coefficient", which here means the amount of difference in egg production (or other characteristic) which will be caused by a one ounce increase in point of lay bodyweight.

(Regression is a very common term in agricultural science, and describes the increase of one thing as another increases. Linear regression, which is what we are concerned with here means that the increase of the second thing is proportional to the increase in the first—the graph of one against the other is a straight line.)

As well as the regression coefficient, I have shown in the Table the mean of each characteristic for all farms and strains, and another figure called the "coefficient of variation". The exact meaning of this need not concern us, but a high value means that there is a lot of variation between farms or strains (as for mortality) and a low figure means that is very little difference between farms or strains as for egg weight).

The figures show expected connection between point of lay weight and end of lay bodyweight. The connection is greater for strains than for farms. Two strains that differ by 1 ounce at point of lay will differ by 1.50 ounces by the end of lay. On the other hand two farms which differ in the weight their pullets reach by point of lay by one ounce will only differ by 0.61 of an ounce by end of lay.

This means that differences due to breeding tend to increase during lay but if the difference is due to something that happened during the rearing period on the different farms the birds will tend to make up for any set-back during the laying period and, will finish nearer the same weight than they started. However they will not completely catch up, 61% of the difference will still be there.

Age at fifty per cent production is a measure of maturity. Lighter strains of bird start laying earlier and heavier ones later. The difference in these trials was .61 days per ounce, so if two strains were 4 ounces different in weight the lighter would reach 50% 4 x .61 i.e. about two and a half days before the heavier one.

Continue on page 7

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Injectable Solution is the best form for getting quickest relief for your poultry and livestock.

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3. Therapeutic levels are built up in the blood in under one hour after administration.

4. It is rapidly dispersed throughout the animal's body.

Here are the recommended doses for your livestock and pets :-

<u>Body weight in lbs.</u>	<u>mg/lb. body weight</u>	<u>Dosage in cc</u>
Under 20	—	2 — 3
20 — 50	—	3 — 5
50 — 100	4.0	4 — 8
100 — 200	2.5	5 — 10
200 — 500	2.0	8 — 20
500 — 1000	1.0	10 — 20
Above 1000	1.0	Above 20



Continued from page 4

**BODYWEIGHT**

This is an advantage for light birds. On the other hand you will see from the Table that for farms the regression coefficient has a minus sign.

This means that heavier birds start to lay sooner, not later, when the extra weight is due to the farm and the way the birds have been reared, that is the environment. So once a farmer has chosen his day olds they will come into lay sooner if they are reared to grow quickly, and the differ-

ence will be 1.94 days for every ounce difference in weight. A four ounce difference in weight will therefore make a  $4 \times 1.94$  i.e. about 8 days difference in the age at which birds reach 50% production.

Eggs per bird follow a similar pattern to age at 50% production. Lighter strains lay more eggs than heavier strains, but after the farmer has chosen his strain he should try to get the birds as heavy as possible by point of lay. An extra ounce at point of lay will add about  $2\frac{1}{2}$  eggs per bird to the years production. It will be noticed that the vari-

ation between farms is greater than that between strains, and is also more for egg production than for bodyweight or age at 50% production.

The figures show that bodyweight is a little bit related to mortality between strains, but not between farms. Even that between strains is not of much practical importance. The variation in mortality is very high, especially between farms, no doubt due to there being disease and other problems on some farms but not on others.

Egg weight in these trials shows very little variation

and is not connected to bodyweight at all. This result is partly due to strains of birds in the Tests. There were very few except hybrids of the white Leghorn type. Therefore it would be a mistake to imagine that these results tell us anything about brown egg birds or heavy breeds.

They do tell us quite a lot about how to choose and manage white egg light hybrids. The lesson is to choose a light bodied strain and then to get it as heavy as you can by point of lay. The result will be earlier maturity, and higher egg production.

TABLE I

Characteristic	Average	Regression Coefficient		Coefficient of variation	
		Strains	Farms	Strains	Farms
Point of lay weight	3 lbs. 4 ozs.			7	7
End of lay weight	4 " 6 "	1.41	0.61	8	7
Age at 50 % prod.	183 days	0.61	-1.94	5	9
Eggs/hen housed	184 eggs	-1.64	2.61	6	10
Eggs/hen day	196 eggs	-1.75	2.41	8	11
Laying mortality %	12.4%	-0.31	—	34	50
210 day egg weight	22.6 ozs./dozen	—	—	2	3
400 day egg weight	26.2 " "	—	—	2	4

Continued from page 4

**OPINION**

Farming is a wide and complex industry wherein enough room can be found for as many as may come forward.

Stockbreeding, horticulture and crop farming offer limitless opportunities. The State Government may not depend only on its regular functionaries but invite volunteers who will help spread knowledge and information about farming.

Shows are to be organised and local people encouraged to arrange Shows on their own.

In this way some youths will be pinned down to farming. Since youths like to copy one another, it is more than probable that more and more yearly will switch to farming - to everybody's good.

The distributive trade in livestock and grocery will also get a booster. In effect more jobs will be created.

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## LETTERS

## AGRIC SHOWS

Dear Sir, It is surprising to note that Agricultural shows are not held here, an agricultural country for that matter. One of my main reasons for returning home is to help popularise mechanical equipment at Agric shows. I feel stranded at home.

We must organise these shows from local to district, state and then federal levels. While I do not want to make an article of this letter, your magazine should see to it that these exercises are taking place.

What of starting a poultry show since more are practising poultry now than any other form of farming. The idea is to popularise a good method and thereby encourage the farmer of a good product be it livestock, fruit or vegetable.

In such shows, sales are also promoted. The village farmer who hitherto usually buries his cash for want of what to invest it upon, is introduced to mechanised farming.

He soon sees the advantages of mechanised farming thus —

- (1) No more arduous tilling of the soil manually.
- (2) Larger area can be cultivated within a short time
- (3) Possibility of attracting bank loans to finance projects
- (4) More and better produce for sale, and the most important
- (5) Improved standard of living.

I do hope the Farmstock will do something serious about this problem.

Kano

Moh. Ladan

*Editor's Note:*

*The promotion of Agric Shows is a financial task too big for Farmstock. Only the State Governments and the Federal Ministry of Mines, Power & Natural Resources are capable of tackling these promotions. But if an attempt is started anywhere, surely Farmstock will play its part timely.*

X X X

## NEWS ROUND-UP

Sir, There seems to be a partiality in your presentation of news. I have noticed over the months that your news coverage is as follows:

- (1) World and news from
- (2) Either N. W. or S E. state. Since there are more states than two, I cannot understand why only two are given prominence.

Minna

Ibn Said

*Editor's Note:*

*We publish news with an Agriculture bias sent to us by those who care. All State and Federal Ministries of Agriculture and Information were appealed to for releases and news bulletins, but as usual someone is always too busy to do the right thing and there is no checking from above about what is done when, how and by whom. Sorry brother, take it cool, we are in Nigeria.*

## GENERAL FARMING

Dear Sir, Your informative magazine has left out general farming too much out of the show. Much space has been devoted to Livestock. While I have enjoyed the magazine so far, I do

not want to invest in Livestock but with nature itself, the soil; and I feel there are many like me who want to desert the pen, hammer or brush for the plough. Please educate us on general farming.

Lagos. Duro Omosunwo

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THE SIGNIFICANT CONTRIBUTION MADE BY BRITISH BULLS TO WORLD AGRICULTURE IS SHOWN BY AN 80 PER CENT. INCREASE IN SEMEN EXPORTS DURING THE YEAR ENDED 31st JULY. BRITAIN WITH WIDE EXPERIENCE OF STOCK-BREEDING AND ARTIFICIAL INSEMINATION TECHNIQUES, HAS VALUABLE RESOURCES FOR THE AMBITIOUS BREEDER.

# BRITISH SEMEN EXPORTS == A Record Year

BY SANDY MACDONALD

Secretary, British Semen Exports, Ltd.

Bulls bred in Britain are making a significant contribution to agriculture all over the world, through the efforts of a young company, British Semen Exports Ltd., (B. S. E.) which have just concluded a record year for sales of Semen to overseas countries.

In fact, the export of 30,000 doses of semen to 26 countries during the year ended 31st July 1969 represents an increase of over 80 per cent, compared with the previous trading year.

How do British Semen Exports operate? Briefly, it is a company formed in 1960 to co-ordinate the sale and export of semen from Britain, to promote the interests of British breeds abroad by the sales of semen and to enable breeders and Artificial Insemination (A. I.) organisations to sell semen overseas.

B. S. E. act as an agent for the sales of semen and receive their income from commission on semen sales and (A. I.) equipment.

They have a small permanent staff and a directorate consisting of representatives of breed societies and (A. I.) organisations.

One of the main objects of the company is to help the private breeder to sell semen abroad as easily as he can in Britain—and in many cases has succeeded.

## BRITISH BREEDS

During the last trading year, semen from 15 British

breeds was exported to 26 countries. But many countries have A. I. organisations of their own, and America and other nations also export semen. Why then is so much British semen exported? Britain, with its long history of stock-breeding and its wide experience in A. I. techniques does have certain advantages.

Britain is an island which is comparatively free from cattle disease. Thus semen can be collected from bulls at cattle breeding centres where animals are under constant veterinary supervision. Every six months bulls are tested for tuberculosis and brucellosis and before semen is exported bulls have to be tested and licensed by veterinary surgeons of the Ministry of Agriculture. Perhaps most important, all semen sent overseas is collected from tested pedigree sires.

The semen itself is usually exported in liquid nitrogen containers and is processed in 0.5 c.c plastic straws which are ready for use when thawed. Extensive experimental work has shown the effectiveness of this method.

Nevertheless, local veterinary officers in Britain say that a major factor is the difficulty sometimes experienced in detecting when the cow is at the correct stage of heat and inseminating at the right time.

## ALL TYPES OF SEMEN

During the last trading year B. S. E. exported semen from 15 breeds. Friesians and Jerseys dominated the dairy breeds and Charolais was the most popular beef breed. Semen collected from virtually any British bull can be

exported. B. S. E.'s experience has shown how many different roles British semen can play.

For instance, British Friesian semen has been used in the Middle East to improve the cow udders. In France, Ayrshire semen has been crossed with indigenous breeds to improve their dual purpose characteristics. Kenya has imported Beef Shorthorns, Devon and Sussex

*Continue on page 13*

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*See page 14 for Rates. Advertisements should reach us a month before the date of publication.*

In the previous article our guest writer discussed General health, our food problem, diseases their carriers aided by primitive customs. He concluded by discussing our livestock abattoir and meat inspection as he touched on milk and its health giving properties. Now go on please.

Animals are great health hazards to a human population. This becomes more serious in areas where medical facilities are wanting and in regions where local customs and superstitions bring some animals to the level of demi-gods. A visit to our rural areas will reveal to us the close association existing between our animals and our people.

It is not surprising to see goats sharing the same rooms with the young children at night

The goats and sometimes sheep often share of the foodstuffs like gari, yam etc. carelessly left about the whole place.

In our homes such sights as children and old woman collecting faecal droppings left in the trail of the herdsman and his charges are not uncommon

### FASHION CUM DISEASE CARRIER.

These droppings serve the purpose of polish for the floor especially during festivals. One only has to consider the innumerable

# THE VETERINARY DEVELOPING

diseases that can be transmitted from animals to man to see the havoc caused by such customs. Great are the numbers of deaths caused by diseases whose etiology has remained unknown. Great advances in clinical pathology have not even paved the way for providing future basis on which to work

initial springboard greater productivity.

### HALF-HEARTED PLANNING

One of the problems confronting us in Nigeria is that the people plan for our progress so half-heartedly without co-ordination

### TRANSMISSION OF DISEASES

A disease like anthrax is blessed with a highly resistant spore which can survive for years on hides, hair wool etc. so it is not impossible to get infected through such articles as leather belt, wigs or even suiting material. This can be of great disaster in a fashion crazy country like Nigeria.

The close interrelationship of animal health and human health is not hard to visualise. With over 11 million heads of cattle, a sizeable number of goat sheep, pigs and poultry, Nigeria has a great livestock potential. It is only by making sure that these animals enjoy good health that this livestock potential can be used as a

Various attempts setting up state farms have not been too successful, not because lack the administrative personnel but because are acutely short of technical experts technical know how.

The farms are seen in areas where there is virtually unavailable we then resort to importing the food and personnel to administering the feed. So our gain the original project go to pay the foreign exchange needed to buy these exotic feed personnel.

Year by year government seems to be aware of this undesirable state as can be seen excerpts taken from various annual reports

Veterinary Division of

# VETERINARIAN IN A NATION (2)

by 'Wale Tomori

Faculty of Veterinary Medicine

Ahmadu Bello University

Zaria.

various state governments viz. (1) 1954/55 Veterinary Division Annual Report.

"The greatest problem of the Veterinary Division has been one staff. Due to the continued scarcity of professional officers,

it is still necessary to organise the field work in the provinces from the Headquarters"!

Nigeria must realize that the more the people the hospitals and clinics keep alive, the more acute food problems become and the more we need our excellent source of proteins — the livestock.

(2) Federal Veterinary Department, Vom 1959 Annual Report. "In spite of staff shortages the department has maintained its valuable work, but it is ordinary that the staff situation should improve, if the many animal health problems of

the country are to receive adequate attention."

"Efforts to train laboratory technicians is progressing, but for professional grades, the position is unsatisfactory. In the past, few Nigerians have come forward for training for a Veterinary career and we have had to rely on expatriate officers whom we are finding more and more difficult

to attract.

I hope it will not be long before our young people find in Veterinary training prospects of a useful and honourable career for the animal resources of Nigeria must

not only be protected from the ravages of disease but must also be expanded if our growing population is to be properly nourished.

(3) Animal Health Division 1963-1964 North Nigeria.

"Staff shortage particularly in livestock section has been particularly active and during the year most of the diagnostic laboratories were either closed or working at much reduced level for lack of qualified staff."

This then has been the general situation in Nigeria to the extent that one state government resorted to giving an intensive training to

Animal Health Assistant to do the job requiring highly skilled professional

Veterinarians. Any wonder we seem to be marking time in the field of livestock production since we had our independence.

Although research stations exist, their results are often kept within the walls of the laboratory for lack of staff to put these into practice-

It is not enough for the government to be moaning about the lack

of this and the lack of that. Nigerians must be encouraged to move into this very important field and jobs must be provided.

We should think less of prestigious projects that do little or no good to the elevation of the standards of our people - we must go real down to earth and get our livestock really on its feet.

Enough of these haphazard methods, we must take care of our livestock' we must provide them with highly qualified veterinarians, and hand in hand with development in human medicine, Nigeria must realise that the more the people the hospitals and clinics keep alive, the more acute food problem becomes, and the more we need our excellent source of good proteins - the livestock.

## IMPORTANCE OF VETERINARY

From time immemorial, Veterinary Medicine has been like a father to human medicine. It is to the Veterinarian and his charge the medic turns for his vaccines. It is the animals the research chemists use as their testing ground for his new drugs.

Since the first Veterinary Medical School was started in France, World Health has been making excellent progress. Will Nigeria be left behind

## News from farms

# IMPROVED COCK EXCHANGED FOR LOCAL ONES

**T**HE NORTH WESTERN STATE MINISTRY OF NATURAL RESOURCES, IN KEEPING WITH ITS GENERAL POLICY OF IMPROVING THE LIVESTOCK RESOURCES OF THE STATE, RECENTLY DISTRIBUTED EXOTIC IMPROVED COCKS IN EXCHANGE FOR LOCAL ONES.

Announcing this here today, the Ministry said that the exchange exercise took place in Dange after adequate unification had been given to the surrounding villages through the co-operation of the District Head of Dange, Malam Umaru.

In the operation 200 improved young cocks

(5-6 months old) raised at the Poultry Demonstration and Holding Centre, Sokoto were transported to Dange where they were exchanged for the local cocks. Thus, for each cock an individual brought, he got an improved cock in exchange. The exchanged local cocks were brought to the Veterinary

Sub-Centre, Sokoto and sold for meat to the public.

The Ministry expressed the hope that these would be used to breed local hens and thus improve and increase the egg and meat production potential of the birds.

The Ministry said that in response to the exercise had been very encouraging, and added that efforts to pursue existing plans in this direction would be intensified to cover strategic locations in various parts of the State.

### CONGRATS TO H M ESUENE

**T**he South-Eastern State Agricultural Development Corporation and Allied Workers Union has congratulated the State Military Governor, Col. U. J. Esuene, on the appointment of Board members for the Corporation.

In a statement in Calabar recently, the President and Secretary of the Union, Mr. I. B. Udoh and Mr. S. E. Akpan respectfully, described the men appointed into the Board as men of integrity.

The Union expressed the hope that the Board members would discharge their duties effectively.

It pledged its co-operation with the Board and called for cordial relations between the Board and members of the Union in order to promote the economic progress of the State.

### BOOST TO AGRIC IN SES

## FARMERS WILL RECEIVE LOANS

**T**he South-Eastern State Government is now in a position to give loans to Licensed Buying Agents in the State.

This was disclosed in Calabar recently by the State Commissioner for Trade and Industry, Chief I. I. Morphy, shortly on his return from an official visit to Lagos.

While in Lagos, the Commissioner held discussions with the Governor and Deputy Governor the Central Bank on how to finance the South-Eastern State Marketing Board.

He also had talks with the Chairman of the Nigerian Produce Marketing Company, Alhaji Dan Chide, on produce evacuation from the State.

Chief Morphy disclosed that steps are being taken to ensure that produce was evacuated in time from the State.

On loans to Licensed Buying Agents, the Commissioner explained that agents who receive the loans must ensure that they use them specifically for buying produce.

He said the object of giving loans to Licensed Buying Agents was to enable

them invest their money in the hands of farmers.

He warned that the Government would not hesitate to revoke the appointment of any Licensed Buying Agents who misuse the loan given to them, or do not pay the correct gazetted produce prices to the farmers.

### AGRIC CHIEF APPEALS FOR LAND

**T**he Controller of Agricultural Services, Mr. Inuaeyen Ndaeyo, has strongly appealed to every division in the South Eastern

State to set aside enough land for Emergency Food Production Programme soon

*Continue on page 13*

### GOVT. LOAN TO COOP

The North Western State Ministry of Natural Resources and Cooperatives has given a total - loan of £6,376 : 4 - d including £825 worth of fertilizers to 8 co-operative societies in Bida Division.

A statement received here today from the Bida N. A. Information Office stated that the Provincial Assistant Registrar of Cooperative, Mr. C. E. Steven, has explained that the loans which were given to farmers to enable them improve their farming methods have already been distributed to the society's branches in Bida, Lapai and Agaie. These, the statement further explained, included Jebba-Gungu which received £486; Ciji - £486; Labozhi - £650; Edozhigi - £180; Badeggi - £613; Takuma - £536; Essa - £227; Muwe - £342; Tashibo - £232; Abugi - £272; Duma - £119; Yelwa - £242; Ebbe - £514; Kuchi - £338; Gbamiko - £284; Capa - £265 : 10s; Ekogi - £230 and Kurmin Gurmana £320.

Alhaji Sa'idu Madakin Bida, the statement concluded, has on behalf of the Bida N. A. outlined the usefulness of the loan to the farmers and appealed to them to make the best use of it as well as to reimburse it accordingly.

Continued from page 12

## LAND

to be launched in the State.

Making the appeal to farmers in Uyo, Eket and Enyong Divisions during a recent inspection tour of farms and Plantations there, Mr. Ndayo stated that between 2,000 and 3,000 acres of land, in one piece, is expected in each Division for the Scheme.

Explaining the objectives of the Scheme, Mr. Ndayo said that it is the intention of the State Government to establish one Food Production Centre in each of the Eleven Divisions in order to combat the present acute shortage and high cost of food as well as avert famine in future in the State.

Besides, he said, the scheme would, among other things, help to accelerate agricultural development in rural areas and go a long way to create employment opportunities for School Leavers and displaced South Easterners.

Continued from page 9

## SEMEN EXPORT

to produce a red beef. Tanzania has used Aberdeen Angus semen to improve beef breeds and Jersey and Friesian to improve diary breeds. Similarly, Ghana has imported Hereford semen for beef cattle and Jersey and Red Poll for dairy and dual purpose breeds.

Apart from selling semen, B. S. E. have made gifts of semen for market development to India, Formosa and the West Indies. The most

recent example is a gift of 3,000 doses from nine British breeds which has been sent to Peru. It will be used at eight provincial centres in Peru where progeny will be compared with local breeds.

It is possible that this gift will interest Peru and other South American countries in the possibilities of British cattle.

### TRIAL RESULTS

In countries where semen has been given, the results of trials produce useful data when future markets in these areas are being considered.

During the past year Commonwealth countries accounted for most of the semen sales. Australia, New Zealand and India were particularly good customers while Kenya also took a good proportion of semen exported to Africa.

Like any other company, B. S. E. realise the value of selling. Sales missions have been mounted by the company in Kenya (where B. S. E. exhibited at the Nairobi Show), other African countries, New Zealand and Australia.

It is possible that in the fairly near future B. S. E. representatives will visit South America where British breeds could well have a promising future.

Sales prospects continue to be good. For instance over 100,000 doses will be exported to Australia over the next two years. As a quarantine period of two years is necessary before export, most of this order is already in store.

So, for the foreseeable future, British bulls will continue to play a major part in world agriculture.

## FISH FOR THE MILLIONS

Fish in recent years have become a common sight. All kinds of fish are now available to feed the nation. It takes a far-sighted fellow to pick on such a venture as the mass production of fish to feed our people.

Fish is perhaps the only animal that is usually consumed as a whole without any side effects i. e. yoyo, and all the parts give the human body certain salts essential to life.

As in all life, fish has classification hence the various types are collectively termed fishes. While the varieties are countless, all fishes fall into three categories; the first group—lean fish contains less than one per cent of fat but has about 10 times that amount of protein.

### HEALTH GIVING

Any food with such a high percentage of protein is a very good food particularly for invalids, small children, pregnant women and the aged. Lean Fish is termed light fish because it is easily digested.

The other main group is the Fat Fish because of its fatty contents. Its flesh mainly oil and water including about 15% fat in addition to its protein contents has more heat giving properties for the consumer than lean fish.

In between these two main groups is the intermediate fish which combines both protein and oil in unequal proportions according to its specie.

### SAFEST FOOD

Fish is undoubtedly the safest human food in that it does not harbour disease. As soon as a fish is infected it either over-powers the disease or dies of it within a few hours. If it is caught in the net before it survives the ordeal, its dead carcass

rots away fast.

Historically, fish is the only animal that is free from ugly stories hence it is eaten with equal relish all the world over by all shades of opinion, creed and climate.

Fish protein is better in many respects than any other animal equivalent. Fish is delicious. Good cooks and housewives are happy when they have to prepare fish. The preparation takes little time and the finished food is usually tastefully fragrant.

Fish soup is always welcome. Other essential nutrients obtained from fish through its oil are vitamins and calcium. Small fishes eaten whole are particularly good in supplying all these qualities.

Economically, fish is the only animal that can be bought for the smallest Nigerian coin—a half-penny. Hence, a pauper or the jobless who has only a small money to spare for food is well taken care of by a plate of fish soup.

### FISH PRESERVATION

It is of interest to fish dealers particularly in places far from the coast to learn of the scientific strides that have been made recently in the preservation of fish. The ice will soon be an old idea. (See our last month's edition)

— Correspondent

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## FARMERS CLUB

in your area and inform  
FARMSTOCK. We shall help build it

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*Screens:* 85 for cover pages 65 for Inside pages (Halftones) matrices and stereos accepted except for cover advertisements.

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The Circulation Manager,  
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from our animal correspondent



## Let's think of a Rabbit Business

IT IS PLEASING TO VOTE THAT MANY PEOPLE WANT TO HAVE A BUSINESS OF THEIR OWN. THEY WANT TO NURSE IT AND PUT IN EVERY WORKABLE IDEA TO INCREASE THEIR PROFITS. SO FAR SO GOOD. WHAT BUSINESS WOULD YOU DO ?

One inexpensive but very profitable business is the keeping of rabbits. Let's now go into a small scale rabbit business. We shall import the Hybrid Norfolk White. The landing and handling charges of 9 does and a bulk we may say are £90.

A small space in an out house or garrage if one has to be rented may be about £1 monthly (area 12' x 10' or 120sq. ft) for food, green leaves plus a bag of a balanced ration mainly pellets monthly (say) £1: 10/-. A small set of equipment is needed and allowing for about 400 by the end of a year, an outlay of £5 is about enough.

For a start a cage 18 inches wide x 3' 6" long is sufficient for each doe. Three can be built together in a row to be 18 inches x 10' 6" long. The frame is completely covered with

wire guaze ensuring that the floor wire is strong enough to support about 12 lbs (to allow for the weight of a full grown doe and buck during mating).

The apartment for the whole lot of nine can be built in tiers with corrugated sheeting as floors below the wire mesh for droppings and other mess. So that in a room of 120 square ft only a small portion of 18 inches x 10' 6" ft i.e. 15.75 sq. ft is used initially. The single buck can be kept in a box in any section of the space until the mating starts when it will be introduced into each cage in turn.

Let us say a keeper earns £5 monthly and for supervisory and maintenance services the owner rates himself £10, total labour cost monthly will therefore be £15.

The initial batch will be at the age of 8 weeks for the does and 12 weeks for

the buck. By then, they are weaned and ready to start growing. For table consumption rabbits are ready as from two months. At three months, the flesh tissues are well formed.

A female rabbit is ready for crossing as from five months and conception is between 30 and 31 days. After the litter (production of young ones) the doe weans its offsprings in 6 weeks. These young can now feed properly on their own. The mother doe is separated from the litter and allowed two weeks' rest before the male rabbit is brought in again. In other words, every three months a new set of rabbits is born. First litter is usually 4, this number increases to about six but the average is 5.

In the first year therefore a rabbit farmer may not expect more than 2 litters; in the following year he gets at least 4 and probably 5

Assuming that the keeper starts marketing after the second litter i.e. after a year's start, how many

## RABBITS

Why not make money during your lax periods. An out-house, a disused garrage or empty backyard can fetch you extra money from rabbits.

### HYBRID

### NORFOLK

### WHITE

*Fast breeding English rabbits produce more than any other breed Pamphlet on feeding & care given with each order.*

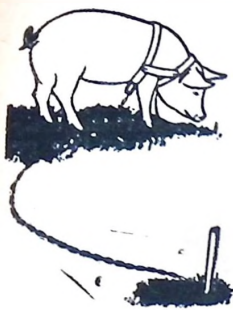
### MINIMUM ORDER :

10 rabbits of 9 females and 1 male.

For more details on price & delivery arrangements please contact,

FARMSTOCK (Rabbits)  
17, Abcokuta Street,  
P. O. Box 79, EB  
Lagos State, Nigeria.

Continue on page 18



**C**ASTRATION is the removal of the testicles from the male and ovaries from the female.

Pigs are castrated to maintain the quality of the meat, to prevent uncontrolled breeding, and to prevent the development of boar odour or flavour that occurs in the cocked meat of an uncastrated male.

As a result of castration, male pigs take on the appearance of a sow rather than a boar.

Boars that are no longer useful in the breeding programme may be castrated to remove the boar odour before they are marketed. By the time the castration wound has healed, the odour usually disappears enough to allow the boar to be marketed.

In some countries female swine usually are not castrated

### TIME TO CASTRATE

Swine may be castrated at any season of the year. Castrating pigs as early as possible lessens the interruption in their growth.

A good time for castrating young pigs is about 2 to 6 weeks of age. At this age, pigs can be more easily handled, the operation is difficult to perform, and wounds heal faster. Also, the quarters of nursing pigs are more sanitary than those of weaned pigs.

### RESTRAINT

The best way to restrain, or hold swine that are to be

castrated depends on the age, size of the animals and the number of helpers available.

Two methods that may be used to hold young pigs are:

Suspending the pig by his hindlegs with his back toward the helper. The helper clamps his knees against the pig's ribs, near the shoulders.

Holding the pig on its back on top of a table. This requires two helpers. One helper grasps the front legs and the other helper grasps the legs; the person doing the castrating stands to one side of the pig.

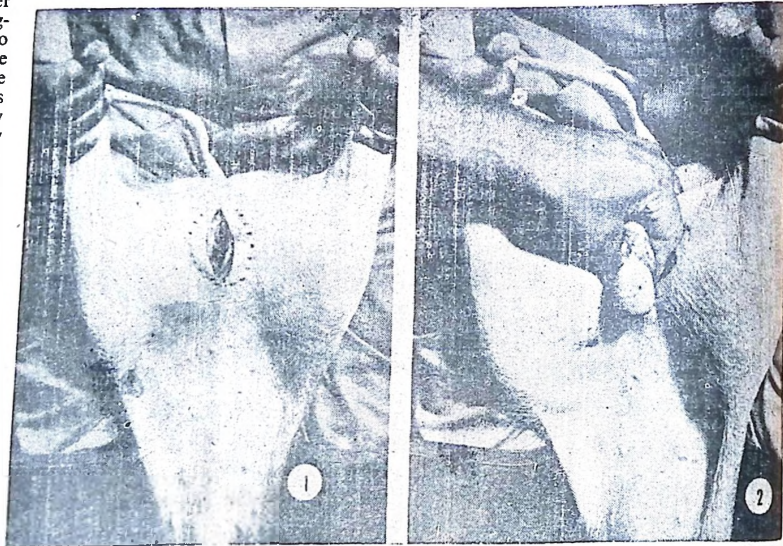
A large boar can be restrained in several ways. No matter which way you choose, you must begin by snaring him about the upper jaw. Make certain that the snare is around the upper jaw and behind the tusks. Tie the free end of the snare to a post.

After the board is securely snared, it can be restrained

*Continue in col 5.*



*The solid line shows where to make incision between the testicles. The dottea lines show the location of the testicles.*



(1) *Make the incision between the testicles as deep as a testicle is thick and twice as long as a testicle.*

(2) *Squeeze the first out through the incision.*

- Due to popular request, this article first published in July '68 is repeated slightly modified.

## Castration Improves Pork

Continued from page 16

for castration by tying all four legs or by hoisting its hind-legs.

Tie a boar with ropes on its legs. Then, throw the boar on to its side in a position for castration. Helpers can keep the boar in position with the ropes or the ropes can be tied to strong posts.

Hoist a boar's hindlegs using a block and tackle. Pass a chain or rope around the boar's body just in front of his hindlegs to make a loop; fasten the loop to a pulley of the block and tackle. Hoist the boar until the hind feet are off the ground.

### THE OPERATION

The first step is to make an incision in the scrotum—the pouch of skin containing the

testicles. This may be done with one or two incisions. The one incision method has the advantage of producing a single wound that usually is located for good drainage and rapid healing.

### PROBLEMS IN CASTRATION

Most of the disorders in the reproductive organs of female swine are either undescended testicles or ruptures (scrotal hernias).

When castrating a large number of pigs at one time, those with either of these conditions should be put aside and operated on separately. If possible, you should have a veterinarian repair a rupture or remove an undescended testicle.

If swine are clean and dry, no skin antiseptic is needed.

When they are dirty and the operation cannot be postponed, wash the scrotal area between the hindlegs with soapy water using a coarse fiber brush.

After washing, the area may be disinfected with an antiseptic solution such as two percent solution of cresol.

### PIGS

If the pig is held on its back, press the testicles downward toward the pig's navel to a position between the fleshy part of the hams.

If the pig is held up by its hindlegs, the testicles will slip into position between the fleshy part of ham. Keep the testicles in position when making the incision by placing your fingers just above the testicles.

Cut directly between the testicles. Make the incision as deep as a testicle is thick and about twice as long as a testicle.

By squeezing with your thumb and forefinger, one testicle can usually be brought out through the incision. Sometimes it is necessary to make an additional incision inside the main incision to expose the first testicle. Hold the testicle with your thumb and forefinger when making this incision.

Pull lightly on the testicle to draw the cord out through the incision. Cut the cord near the edge of the incision.

Hold the second testicle with your thumb and forefinger and cut through the tissue that surrounds the testicle. This testicle can be brought out and its cord cut in the same way as the first testicle. Small pigs need no further treatment. The incision usually heals in 2 to 3 weeks.

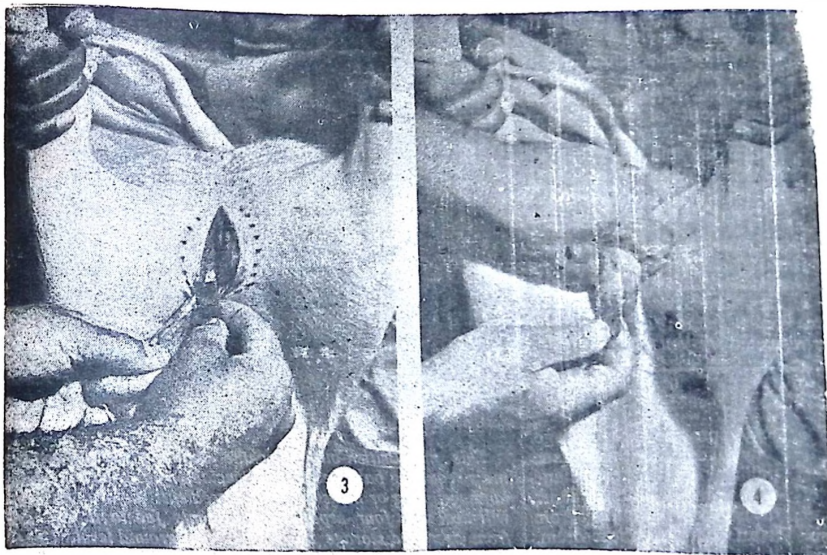
### SELLING UNCASTRATED BOARS

Many mature boars are sent to market uncastrated; they are sold to packing plant that can use meat from boar carcasses. If you are considering castrating a boar before selling him, check market prices. Often the loss in reduced price of an uncastrated boar is less than the cost of feed and labour in keeping a castrated boar until he is ready for market.

### BOARS

The one-incision method is less difficult for large boars than the two-incision method because the skin of the scrotum is not nearly as thick as tough along the midline as it is over the testicles.

To remove the boar's testicles, the incision must be made through the scrotum because the testicles will slip down between the fleshy part of the hams as they do in a pig. Hold the scrotum with one hand, and make the incision with the other.



- (3) Pull the testicles lightly to stretch the cord. Place your knife (or a clean single-edged razor blade) against the cord near the edge of incision and cut the cord.

- (4) Make the smaller incision inside; the main incision to expose the second testicle.

Continue overleaf

Continued from page 15

rabbits are likely to be in his farm and what are the probable cost and selling prices?

Starting in January, with nine does and one buck, the first litter comes off in May. Since each doe produces at least 4 offsprings of equal sexes, the whole nine will produce (9 x 4) 36 of 18 males and 18 females. By Aug. the original 9 will litter again producing another set of 18 males and 18

females.

In November the original 9 plus the 18 young females of May making 27 will litter 108 of 54 males and 54 females. In January the original 9 plus the 18 of May, plus 18 in August plus 18 in Nov. making 63 will litter at least 252 baby rabbits and so on and so forth. So in the first year one would have got 18 young male rabbits (at least) to sell in August (2 months old) 54 young ones to sell in January and over 100 in the following March.

What about costing? It is good to estimate on a yr. thus —	
Initial flock of 10 rabbits	£90 - -
Cage (allowing for expansion) of flock.	
4 sets of 3 tiers each at £5 per set of tiers	20 - -
Rent of space at £1 per month	12 - -
Food at £1 10/- per month	18 - -
Feeding equipment	5 - -
Keeper's salary at £5 per month.	60 - -
Remuneration for management at £10 per mth.	120 - -
Depreciation of equipment at 2/6 per month	1 10 - -
	<hr/>
Over-heads for the year	10 10 - -
	<hr/>
	337 - -
Interest on Outlay at (say) 10%	33 - -
	<hr/>
Profit at 12.5%	£370 - -
	<hr/>
	44 - -
	<hr/>
<b>Grand Total</b>	<b>£414 5 - -</b>

Assuming that there are 400 rabbits on the farm by the following March and each is roughly 6 lbs in weight each rabbit then costs £1 4/- if we realize that chicken sells roughly at 4/- a pound. The total value of the flock will therefore be £1 : 4/- x 400 i.e £480. If the outlay plus profit is £420, then an additional profit of £60 which we shall call scarcity value has been made.

By the second year of operation the unit cost will fall considerable low to make selling a whole rabbit at 15/- or less a really rollicking business.

**NOTE**

After a break of some period to see what interest people are showing in our first series on rabbits our Animal Correspondent Mr A. Olukotun begins a series of articles and answers to questions in our November issue. So send in your enquiries, questions and opinion to our Rabbit Correspondent who will strive to satisfy you please, Editor

**PORK**

Continued from page 15

Start the incision between the testicles, at the middle of the scrotum and cut down to the bottom of the scrotum. Extend the incision beyond the edge of the scrotum. Make the incision large enough to remove the testicles

and to provide good drainage. By squeezing with one hand pulling on the testicle and cord with your other hand, the testicle can be freed from its attachments in the scrotum. It is preferable to remove the testicle with its coverings intact. However, if the covering is cut through and the

testicle is exposed, continue the operation. If possible remove the testicle covering from the scrotum after the testicle is removed.

Usually, it is necessary to cut through the tissue dividing the scrotum to expose the second testicle. Then, the testicle can be removed in the same way as the first.

Boars usually need no further treatment. Their incisions usually take longer to heal than the incisions in pigs.

**PRECAUTIONS**

Following castration, most swine need no further treatment. However, if an animal any has unnatural swelling or

appears sluggish, examine carefully, if you feel it needs treatment, have it examined by your veterinarian.

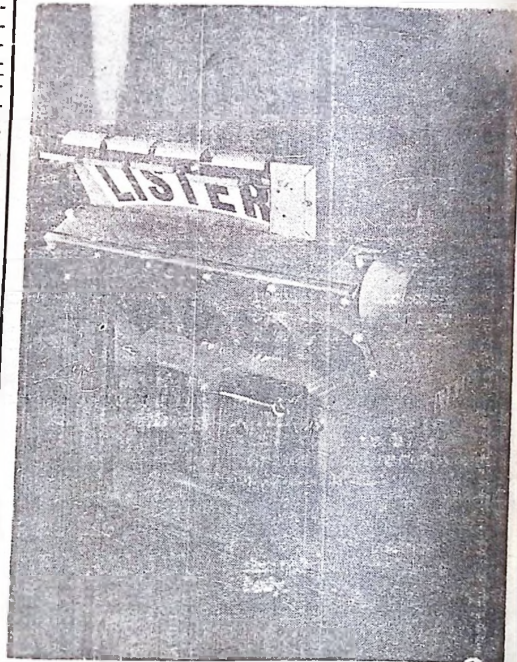
Some of the complications that develop in castrated swine are peritonitis, hemorrhage, septicaemia and scirrhous cold. The best way to prevent these conditions are:

An incision located to give good drainage.

Clean quarters for newly castrated pigs.

Prompt attention when sluggishness or swelling occurs.

Application of insect repellants when needed, especially in the fly season by applying repellants, follow instructions on the container label.



This new British-built machine should prove a boon to farmers requiring balanced feed. Specially designed to eliminate land weighing or measuring the ingredients before milling, it will deal with four separate ingredients fed to it by gravity from overhead storage by augers from ground level. Once set, the machine can be left unattended. Should any ingredient run out or become blocked, an automatic switch stops the operation. Manufacturer: R. A. Lister & Co. Dursley, Gloucestershire, England.

# FARMSTOCK

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The Israeli Breeders Union p. 10

Why not try Farming? pp. 10&11

Some Rabbit Terms p. 13

**DEC. '69**

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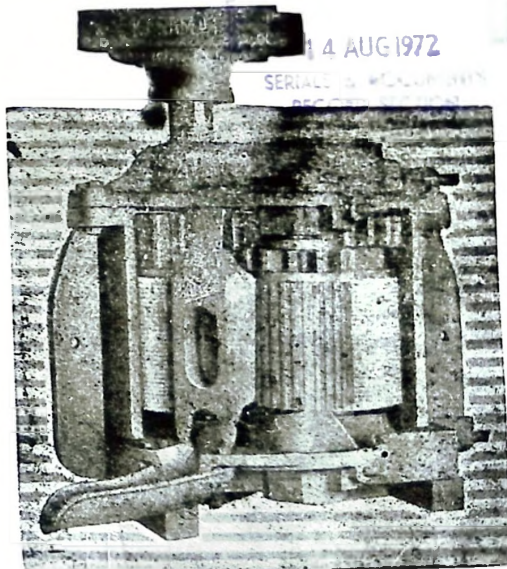
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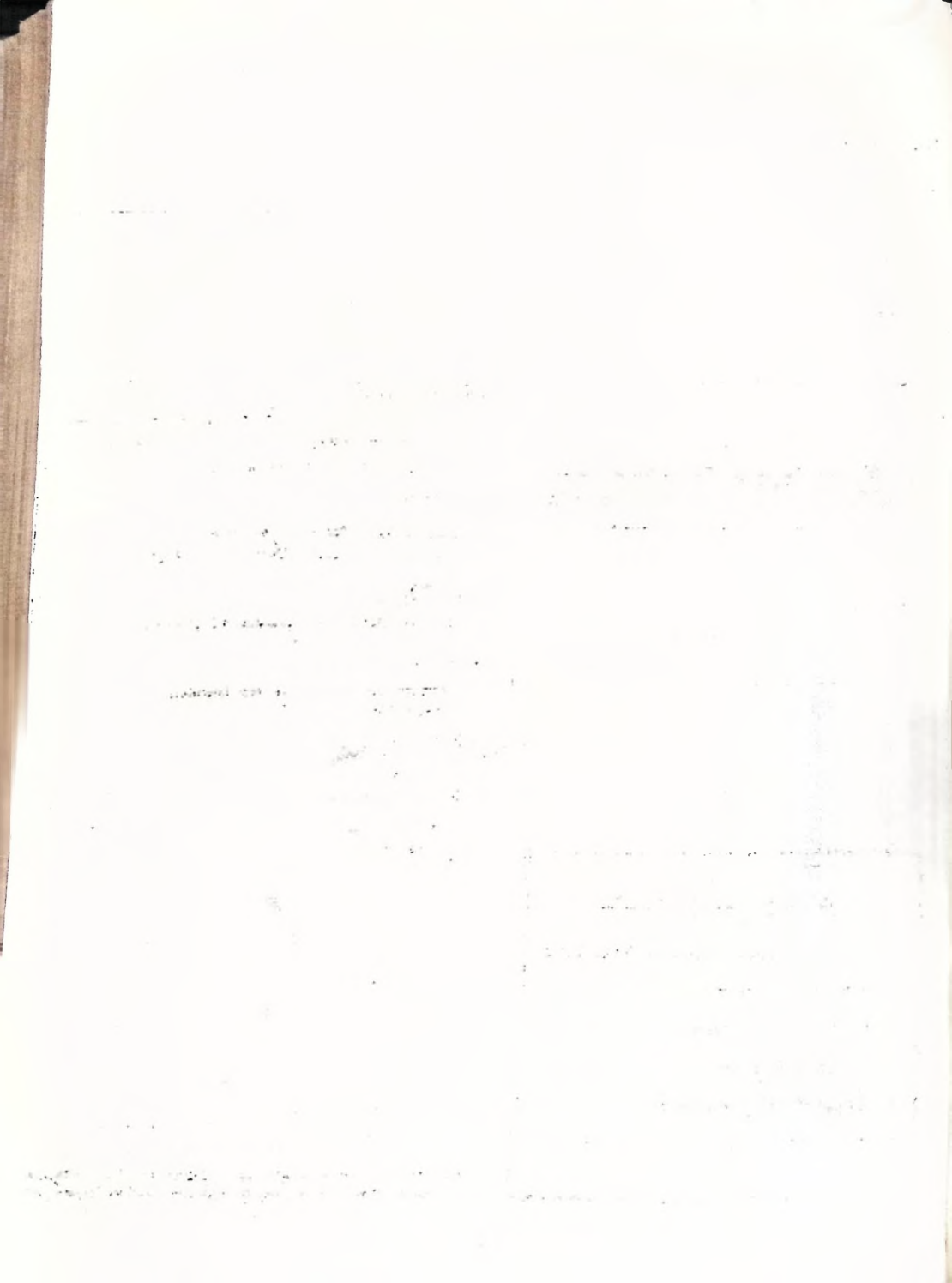
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Dec. '69  
Vol. 1 No. 15  
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# FARMSTOCK

MANAGING EDITOR: ABIODUN OJUGBELE

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## OPINION

### FARM COMBINES

**T**hat a single hand cannot lift a load and place it on ones head is an age-long witty statement which still holds water today.

Certain endeavours are best done by a group. Some are individualistic and may be possible under extreme privations but resources being usually limited under solo effort, discouragement usually results early.

In this age of mechanisation, mechanised farming even under a plant hire system may be prohibitive for a single farmer.

While we do not advocate fusion of farms because of personal will even at the expense of efficiency, it is necessary to act collectively.

A group of adjacent farms may pay for services rendered on all the farms charged together.

Under combines jobs will be more expertly handled and carried out by the cooperators. More capital will be available and marketing will be well planned.

Many have pieces of land dotting the country side. These can be lumped together under a manager instead of leaving such pieces as thickets.

Put under the plough such areas will produce food for the good of all.

## LETTERS

### SO MANY YET SO COSTLY

Dear Sir,

*It does not seem that our country will have a good period again. Why I say this is due to the soaring prices of everything. Our government is so engulfed in prosecuting the war that no time is spared to find out if the governed are not facing another war tacitly.*

Let us focus our mind on eggs. Prior to the introduction of foreign chicks that produce eggs profusely, there were eggs for the asking.

But now that eggs are even mass-produced an egg still costs as much

as 6d each and this is even the putrifying local guinea fowl egg.

The good and scientifically mass-produced egg is hard to come by for the humble.

How can anyone be sure of a

good day's meal under these frustrating circumstances! No meat, no fish, no yam, no garri. I share the opinion of many that the time is up that we should have some able group to look after the production and distribution of food.

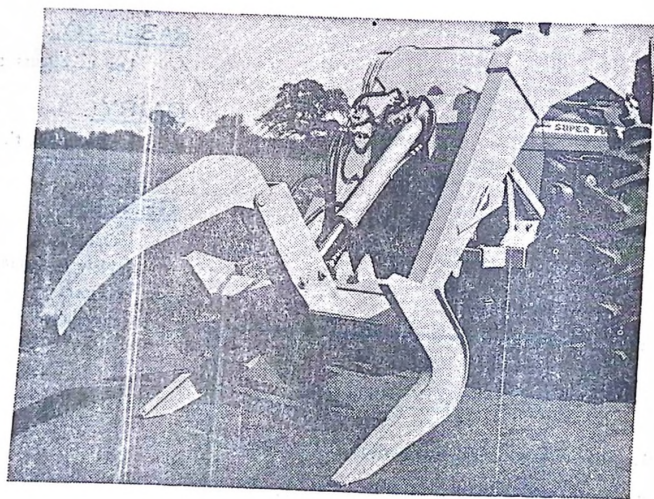
Many will never be able to own a car or much more a house of their own; still many more will never be able to rent a flat of rooms with conveniences because no programme can attain such for a teaming and populous country as Nigeria. But the Government can ensure good food for every citizen by heavily subsidising farming and evenly distributing the harvest.

Times there were when one wished to die and part with all talk of this nil, that nil.

Lokoja Luke Yorber

Continue on page 9

## New Equipment



### New British Multi - Purpose Log Grab

This new log grab, capable of lifting timbers ranging in diameter from 4 inches to 30 inches, has been developed by the British firm of Bomford and Evershed and will be on view at the Royal Smithfield Show opening at Earls Court, London, on December 8. It is designed as an attachment for the Sapper-Bomford loader as fitted the County 654 and 754 tractors.

An important feature of the grab is that the tines mesh with each other thus preventing any material losses and giving more power to the 'bite'.

Attachment is by three pins to the loader booms and crowd ram. An extra control valve unit and hydraulic piping is supplied for operating the independent action clamp arm ram.

Maximum lifting capacity to the full discharge height of 10 feet 4 inches is 2,800 lb. with a tip angle of approximately 40 degrees. Tip angle at ground level is about 105 degrees and roll back at ground level around 10 degrees.

Manufacturer: County Commercial Cars Ltd., Albert Street, Fleet, Hants. England.

Advertisement**PRODUCE MORE EGGS FOR XMAS****WITH****TERRAMYCIN EGG FORMULA**

Do you want more eggs during this Xmas season when egg prices are highest throughout the year? Yes! You must take advantage of this upward swing in the price of eggs because you need more money during this festive season.

*But how can you boost up your production when we are now at the onset of the dry season which always imposes stress on your layers? From your personal experience, you know that stress always disrupts the normal life of your layers, predisposes them to increased infections which consequently lead to drops in egg production.*

Therefore, your answer lies in the correct use of Terramycin Egg Formula.

Why do you need Terramycin Egg Formula? Because it is the only product specially formulated to give your layers the vital tonic which will increase and maintain your egg production.

In addition, it contains Terramycin which ensures that stress does not arise while simultaneously, "disease" problems are kept at bay.

Therefore you must adopt this Terramycin Egg Formula programme now.

Here is how to make it work for you:

- (a) If your pullets are at the point of lay, use 1 level teaspoon to 2 gallons of water for the first 4 weeks, and continue after this at 1 level teaspoon to 10 gallons of water.

This will prevent point of lay mortality, enable your pullets to peak earlier, attain a higher peak, and sustain it longer.

- (b) If your layers are at end of lay, use the same 1 level teaspoon to 2 gallons of water till culling.

You will reap the reward of increased production of large eggs, characteristic of layers at the end of the laying cycle.

- (c) During stress periods, e.g. very hot days, intensely cold har-mattan nights, use 1 level teaspoon to 2 gallons of water until conditions im-

prove. Then continue at 1 level teaspoon to 10 gallons of water.

- (d) At any other time, use 1 level teaspoon to 10 gallons of water continuously.

This will enable your layers to reach and surpass their bred-in potential and so give you maximum profits during this Xmas when you need money most.

Terramycin Egg Formula is a worthy investment that always pays rich dividends. Invest in it today, tomorrow may be too late.



## KEEPING LAYERS FOR A SECOND YEAR

BY L. J. ELSMLIE (M. A. Cantab)  
*Technical Director, Ejinaka & Thornbers Ltd.*

IN FORMER TIMES MOST LAYING BIRDS WERE KEPT FOR AT LEAST TWO YEARS OF LAY, AND INDEED ONLY SECOND YEAR HENS WERE USED FOR PRODUCING HATCHING EGGS. SCIENTIFIC AND COMMERCIAL CHANGES HAVE NOW MADE IT MORE PROFITABLE TO REPLACE LAYERS AFTER A SINGLE YEAR OF LAY, OR PERHAPS JUST A FEW WEEKS MORE, BUT OCCASIONALLY THERE WILL BE TIMES WHEN IT PAYS TO KEEP LAYERS ON FOR A SECOND YEAR EVEN NOW.

ONE REASON FOR KEEPING THE BIRDS ON COULD BE A SHORTAGE OF DAY OLD CHICKS FOR REPLACEMENTS. ANOTHER COULD BE A HIGH PREMIUM FOR LARGE EGGS, AS SECOND YEAR BIRDS PRODUCE A GREATER PROPORTION OF BIG EGGS THAN DO FIRST YEAR BIRDS.

Birds which are to be kept on should be force moulted at the end of the first year. Moulting is the natural process of the bird shedding its old feathers and growing a new set. This happens naturally once a year - in non-

tropical countries declining day length at the end of summer starts the moulting-but can be caused to happen at any time by anything which upsets the bird enough.

Small upsets may cause partial moulting, of the neck feathers only, or of only some birds in the flock. Very unsuitable systems of keeping birds, such as large cages at high density may cause continuous moulting.

Force moulting is the causing of the birds to moult all at the same time by keeping them without water and food for 24 hours, and feeding an unbalanced ration for some more days. The

### MONTHLY ADVISORY SERIES



### NEW HYBRID HEN LAYS ONLY BROWN EGGS

The Sykes Brown hen - a new hybrid developed in Britain and reputed to lay only brown eggs! The breeders claim the bird can produce large brown eggs at the rate of 245 a year under average farm conditions; and 275 in a laying year. Fifty-five per cent of these eggs grade out large, while 45 per cent are standard grade.

The hybrid is a uniform dark chocolate in colour and took 6 years of research to develop at the cost of £250,000, involving the use of the breeder's £60,000 computer. During rearing, 98 per cent of the chicks survive and 95 per cent of the birds when in lay.

The Sykes Brown hen converts medium-energy food efficiently (4.2-4.5 ounces per bird per day) and weighs 5.3-5.6 lb live weight at the end of lay. It is said to reach 50 per cent efficiency of production at 23-25 weeks of age and reaches peak production by 30 weeks. Other advantages include high disease resistance, fast feathering, docile temperament and negligible broodiness.

Breeder: Sykes International, Warminster, Wiltshire, England.

process consists of two stages. First dropping the old feathers, and secondly growing the new feathers. After the new feathers are grown the bird resumes laying, which had stopped at the beginning of the moult.

After the birds have grown their new feathers egg production rises to a peak, and eventually gets less again in the same way as in the first year, but with the following differences.

- (1) Egg production per bird is less, about 80 per cent of that in the first year
- (2) Egg size is bigger
- (3) Food consumption is similar to what it was at the end of the first year. That means that the average for the year is higher.
- (4) Shell quality is good just after the moult, but on average is not quite as good in the second

Continue in next column

## POULTRY

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year as in the first.  
 (5) Production and shell quality are much better from birds which are force moulted than from those which are kept on laying without a rest, and profits are higher too. From these points one can see that birds which have done well in their first year are the ones most likely to do well in their second year, so the flock to keep on is one which has done well already. A flock which has not done well in its first year is very unlikely to do well in the second, and therefore should be sold off rather than force moulted.

Force moulting should begin about 68 weeks of age, a little sooner or later according to the performance of the flock and the farmers need for eggs. First it is necessary to go through the birds individually, keeping only the best for moulting and the second year. Non-layers, sick, weak, or backward birds should not be force moulted, but sold off as table birds instead.

To carry such birds through the unproductive moult period would just be a waste of money as there is no chance of them doing well in their second year, and some of them may even die. Perhaps 10-15% of the birds may be culled at this stage, depending on the quality of the flock. The culling must be done before moulting begins since it is impossible to cull a flock properly once moulting has begun.

The method of getting a good moult is as follows:

- (1) Keep the birds without water for 24 hours exactly.
- (2) Leave the birds without food for the same 24 hours but do not feed them until they have been without food for a total of 48 hours.
- (3) Feed ground corn only for 3-4 days, or until the feathers are dropping rapidly.
- (4) The birds must now be fed a good ration to grow new feathers and to build up reserves of calcium in preparation for the second

*Continue on page 9*

# TOUGH AND RUGGED!

## EVEREST boots



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THE SIGN OF GOOD SHOES



# Crop Hand-Spray Saves Cost of Aerial Spraying

BY COLIN REID

A SMALL HAND-SPRAY WORKED BY A BATTERY AND COSTING ABOUT £5 BUT GETTING RESULTS FOR PROTECTING CROPS AND PLANTS ALMOST AS GOOD AS SPRAYING FROM AIRCRAFT HAS BEEN INVENTED IN BRITAIN.

It is going into production first with a view to meeting demand in developing countries.

In a trial in Sudan the inventor, Mr. E. J. Bals, sprayed 16 acres (6.475 hectares) of wheat in one hour. This comes near to the rate of spraying from aircraft.

Demonstrations are to take place in developing countries where the cheapness and good results of the use of the invention are felt to be needed.

The inventor has also developed two large kinds of his spray. One, an engine-operated machine is expected to cost about £45. The other, which can be fitted to a tractor, he intends to sell at under £300.

His inventions are being backed by Britain's National Research Development Corporation (N. R. D. C.), the government authority which, after a good deal of test work, has approved for manufacture a number of British inventions. since used all over the world.

## FINE AND EVEN DROPS

In the normal way, plant and crop-killing pests are sprayed from aircraft. They use killing substances dissolved in water squirted at high pressure through nozzles at rates of up to 200 gallons per acre (2,275 litres per hectare), sometime unevenly.

The secret of Mr. Bals' invention is that it squirts out finer and more even drops of liquid. These not



The crop hand-spray under demonstration

only cover a wide area but spread the effect over plants and crops very evenly. Some of the insect-killing sprays to be used will have concentrated forms of liquids, so will be able to cut down the amount used.

British experts believe that oil is a much more useful carrier of pest-killing substances than water. This is because oil does not wash off the leaves when it rains and does not evaporate before it reaches the plants in spite of tropical heat.

America and Canada where much interest is being aroused. A consumer demand is expected in the developing countries of South America and Africa.

## Enquiries:

The firm making the sprays is Micron Sprayers Ltd., of Bromyard, Herefordshire, with temporary works at Philips Street, Birmingham 6, England.

"Plants and pests are water-proof but they are not oil-proof," explained Dr. M. S. Barber of the N. R. D. C., "so we are recommending the use of oil-based pesticides."

Mr. Bals has recently been visiting the United States of

ALWAYS

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Continued from page 4

LETTERS

YORUBA FARMSTOCK

Dear Sir,  
In recent times, I have come across a few copies of your good paper-FARMSTOCK. It is such a good material which should enjoy wide patronage but the main handicap of our people is English. Can't a Yoruba edition of FARMSTOCK be produced.

Oyo Ayan Jemiade  
May be a Yoruba edition will see the light of day sometime but what of the other Nigerian languages then if a Yoruba edition begins to circulate.

Editor

I'LL QUIT IF

Sir,  
I am a school-boy. Every holiday my parents always send us to the farm: we work from morning till night.

When we get yams or maize my parents say they are going to Lagos.

Please Mr Editor, tell them in Lagos, work in the farm is hard. If people want food, they should send machines, if I leave school and we have no machines, I will come to Lagos too and leave hard work,

Epe O. Rufa

Continued from page 6

LAYERS

laying year. Feather growth needs protein, particularly the amino acid cystine, which plays an important part in the chemical structure of the keratin of which feathers are made.

The ration during moulting should therefore contain a good quality protein with a high level of cystine. Any good growers ration, but not one of the "pullet developer" type, is suitable, and should be fed from the time the feathers are seen to be falling until five weeks after the start of the moult, when it is time to return to a complete layers ration.

Egg production begins about 8 weeks after the beginning of the moult, so that by feeding a layers ration from the fifth week the birds have time to build up a sufficient reserve of calcium before laying begins. However if limestone grit or oystershell is available it is quite a good plan to give 1 ounce per bird on the day corn feeding is begun. This will allow the birds to correct any deficiencies they may have at the end of lay.

The cost of moulting is fairly high. If the birds are out of production for 8 weeks and eat 4 ounces of feed a day at 4d. a pound that will cost 4/8 for 14 lbs. of feed per bird. In addition there is the cost of labour and the room the birds are taken up while not producing.

However it is quite certain that if birds are to be kept for a second year force moulting will improve their performance and profit after the rest.

And if both day old chicks and eggs are in short supply the second year's lay may pay handsomely.

The following figures are an example of how birds can be kept for a second laying period.

AGE OF BIRDS

0-20 weeks Rearing  
20-48 weeks Laying, first year  
Say 200 eggs per bird, or 20,000 per 100 point of lay.  
48-56 weeks Moulting.  
second year starts with about 75 birds for every 100 which started the first year. 10% may have died, and another 15% then culled before the moult, and sold off the moult, and sold off the moult.  
56-96 weeks Second year lay. Eggs per bird expected in a full year would be 80% x 200, but if the second year is not quite completed we could expect about 136 in 40 weeks of lay, 10,200 from 75 birds.  
The 100 original birds have therefore produced 30,200 eggs half as many again as they would have done if sold off after the first year. The second year eggs cost more as the example shows. On the other hand the eggs are bigger, and if the price is right and chicks are scarce they may be profitable.

EXAMPLE COSTING TO SHOW PRODUCTION COSTS OF FIRST AND SECOND YEAR EGGS

FIRST YEAR		SECOND YEAR	
Point of lay cost 100 x 15/-	1500	shillings per 100 birds	2800
Feed, 48 weeks at 7d	2800		
Total cost	4300		
Less culls sold 90 at 6/-	540		
Cost of eggs	3760		
Eggs produced, number.	20,000		
Cost per 1,000 eggs in shillings	188/-		

Readers will understand that these figures are not intended to show all the costs of egg production in either year, but to show how the higher cost of second year eggs

happens, and give an idea of how big the difference in costs is likely to be.

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Advertise to get him

See page 14 for Rates. Advertisements should reach us a month before the date of publication.

From now on and from time to time, we shall spotlight the activities of CO-OPERATIVES in other lands with a dual purpose namely to help Israeli farmers understand the working of such systems overseas and (most important) apply the principles here. This month therefore, we start with an Israeli Cooperative.

THE COOPERATIVE: OVERSEAS (ISRAEL)  
**THE POULTRY BREEDERS UNION** : ITS AIMS AND FUNCTIONS  
 BY OUR SPECIAL CORRESPONDENT

THE NAME IMPLIES. THE POULTRY BREEDERS UNION IS AN ASSOCIATION OF ISRAEL'S CO-OPERATIVE POULTRY FARMS WHICH PRODUCE REEDING STOCK. THE UNION INCLUDES ALL BREEDERS, FROM THE EDIGREE LEVEL TO THE COMMERCIAL LEVEL, AND ALL FORMS OF POULTRY: CHICKENS, TURKEYS, DUCKS, AND GESE.

The Union (which we all henceforth call by its Hebrew name, Igud) encompasses 126 member farms from the various types of cooperative and collective settlements. Kibbutzim and moshavim. These farms represent approximately 85 per cent of Israel's total poultry breeding capacity

**AIMS**

- The Igud has the following principles functions:
- 1) To maintain and improve the technical and professional level of its member farms.
  - 2) To efficiently market both in Israel and abroad the produce of its members.
  - 3) To achieve the first aim, the Igud maintains a professional and veterinary department staffed by a full-time veterinary doctor and field

advisors. In conjunction with the Israel Poultry Growers association the Igud maintains a full time geneticist. The Igud carries out random-sample field tests for broiler, and its farms comprise 95 per cent of the participants in the government-run random-sample tests at Acre.

**ANY FARM WHICH DOES NOT MEET THE HIGH STANDARDS SET BY THE IGUD, OR WHICH DOES NOT COMPLY WITH THE INSTRUCTIONS OF THE PROFESSIONAL AND TECHNICAL DEPARTMENTS, CAN BE EXPELLED FROM THE IGUD.**

**SALES**

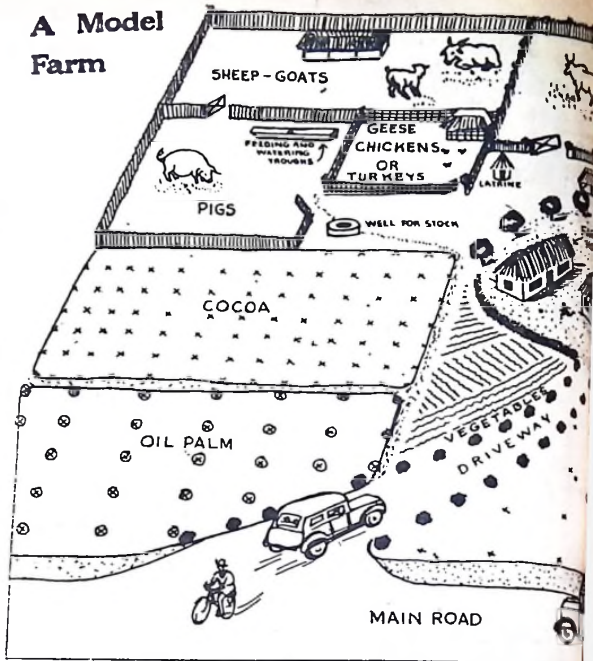
The sales division of the Igud, located in its main offices in Tel. Aviv, consists of 60 men and women who are engaged in selling and coordinating shipments. The Igud processes and handles approximately 40 million hatching eggs and another 35 million goes to export, mainly to Europe (Italy, Austria, Greece, France, Spain, etc.) and to Iran.

The Igud sells to seven African countries, to several Far Asia, and also to North and South America.

To promote and facilitate this growing export, the Igud has established subsidiary companies and cooperating hatcheries overseas:

Continued on page 15

**A Model Farm**



**WHY NOT**

Asks A. K. OLUTOKE

**OUR COUNTRY NEEDS MORE AND BETTER FARMS IN ORDER TO MEET THE HEAVY DEMANDS OF HER OWN PEOPLE AND FOR THE EXPORT OF FARM PRODUCE. THIS MONTH I SHALL TRY TO ANSWER SOME OF THE QUESTIONS THAT PEOPLE ASK WHO ARE INTERESTED IN SETTING UP THEIR OWN FARMS.**

**CAPITAL**

In farming, as in any other business, you can start with little capital, and by hard work, you can earn a very good living. But more capital has its advantages in that you will be able to invest in better land, modern implements and farm machinery.

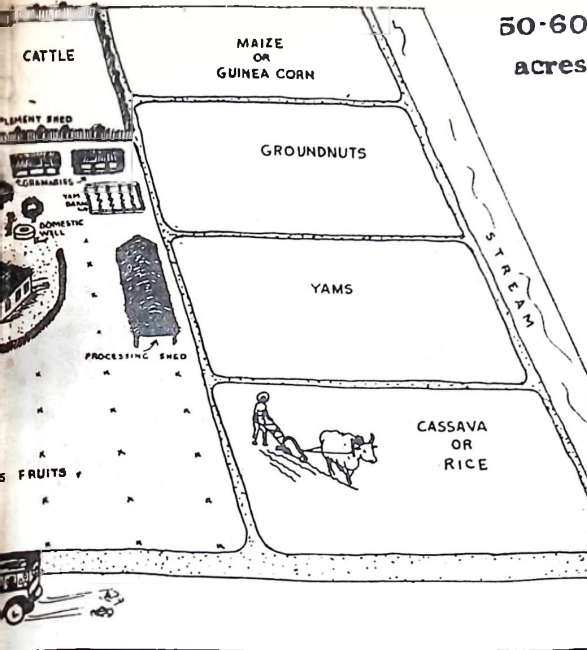
The fact that you have little capital should not keep you back, however. What you will need most of all is enthusiasm, confidence in the future and willingness to work hard. If the outlay will be too much for you alone, you can make it a joint venture with enthusiastic friends

or raise loans

**LAND**

In some areas it is possible to buy land for farming purposes. Land is also leased or rented to individuals or families who own land. The Local authority in your area will tell you how to find out about this.

In choosing your farm, be sure the land is fertile. Look to see what kind of plants are already growing on it. Check with the nearest Agricultural advisory officer. He will know whether the land will be good for farming. The land should have an



50-60  
acres

# RY FARMING ?

Our Farming Correspondent

contaminated, continuous, clean water supply, even in the dry season, either from high water level wells or streams. Your farm should be near a good market, and must have good transport facilities to nearby markets and towns.

Your farm should be compact; that is, the whole farm area should be enclosed within one ring boundary. For a start you need between 10 to 60 acres divided up as shown in the accompanying diagram above.

## LIVING QUARTERS

This is most important. You must live on your farm. Your house and other farm buildings must be in the centre of your farm. You must have a road leading through your farm right to your house.

In all the highly developed countries, this system is followed. It makes possible continuous and detailed observation and supervision, which are necessary in all agricultural work.

## TYPE OF HOUSE

If you are starting off with reasonable capital, a simple, modern block or brick house is good. It should have a water supply and good sanitation.

If you do not have much capital, a mud or bamboo hut with waterproof roofing, concrete floors, and adequate ventilation is good enough for a start and will cost a lot less than a block or brick house. Grass lawns and flowers around the outside of any house will make it attractive.

If you cannot have a supply of electricity to start with,

simple kerosene or pressure lamps will provide good lighting for your house and farm buildings.

## TYPE OF FARMING

In order to produce all the types of food which we need or healthy living, most farmers practise mixed farming. Mixed farming includes both the cultivation of the soil and the rearing of animals.

If one decides to raise animals (sheep and goats, for example), it is advisable to pick them from a good breed in the locality in which one is farming. In this way one will avoid the big problem of diseases and pests. Besides, the atmosphere will not be strange to them.

Far too many farmers depend on hunting for their supply of meat. This is a foolish practice. They should keep a few heads of sheep

and goats from which they could slaughter, take a little for food, and salt or dry the rest of it for future use.

This is the way the salted meat you buy in the market is prepared.

A wise farmer will produce his own meat. He will also have his own chickens, eggs, vegetable, and other food crops. He will be able to eat well and to invest in better living.

## TECHNICAL KNOWLEDGE AND EXPERIENCE

Visit good farms in your area. Some farmers will be glad to advise you. You can also work as a farm labourer under a good farmer to gain experience. There are also good books on farming that you can read; they will be helpful. Choose the books that tell about the kind of

Continue on page 15

## JOHN HOLT MOTORS



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BENUE/PLATEAU TAKES A BIG FORWARD LEAP

# 20,000, POULTRY FARM OPENS IN JOS

The commencement early in December of a huge poultry business in Jos has been announced. The Company - Highland Farm - is to begin operations with some 3,000 layers which

are expected to feed Jos and environs with about 10,000 eggs weekly.

This is an attempt to boost the State's economy in particular and Nigeria's generally according to the Managing Director - Mr. Ayo Kehinde. At the head of a team

of 50 farm workers is Dr. C. A. Ogunbuyide formerly of Veterinary Research, Vom, a qualified agronomist who had studied in India, Britain and Denmark. He is the Farm Manager. He specializes in animal nutrition, animal breeding and parasitology.

## YOUNG FARMERS MEET

A three-day annual meeting of Young Farmers Clubs has just ended near Lake Natu at Bukura Farm.

This was disclosed by the Assistant Agricultural Superintendent, Malam Adamu Waru in a release issued recently by the Ministry of Natural Resources. The meeting which was attended by three delegates from each of the sixty Young Farmers Clubs in Sokoto Province, and some delegates from Niger Province and Agricultural Extension Staff was designed to promote mutual understanding and to exchange ideas on the work of clubs.

The release added that delegates had lectures on club activities, crop production, poultry and several other subjects.

## 'PAY GOOD PRICE' - GOV.

The North Western State Military Governor, Police Chief Superintendent Usman Faruk has called on the management of the Northern States Marketing Board to reconsider the current price offered by the Board farmers for their shea-nut produce.

Chief Superintendent Usman Faruk was in his office exchanging views with the Chairman of the Marketing Board, Alhaji Idris Gana, Etsu Pategi, and the General-Manager, Alhaji Ahmadu Kurfi who called on him at the Government House recently.

The Governor observed that the present low price of £16 per ton offered by the Board has led the farmers to sell their produce at higher prices in the black market.

He also accused some un-

scrupulous Local Buying Agents who, he alleged, were collaborating with some other dealers to 'smuggle' agricultural products outside the country. Governor Faruk described the practice as highly unpatriotic which, he added would have adverse effect on the country's economy.

The Governor said that his Government would cooperate fully with the Marketing Board to curb smuggling practice of agricultural products by Local Buying Agents or any other body concerned.

Replying, the Chairman thanked Governor and promised that the Board would try to boost agricultural production and offer more attractive remuneration to farmers.

## Clans Offer Land

VARIOUS CLANS IN OGOJA DIVISION HAVE OFFERED DIFFERENT PARCELS OF LAND TO THE STATE GOVERNMENT FOR AGRICULTURAL PROJECTS.

THIS IS IN RESPONSE TO THE GOVERNMENT'S RECENT APPEAL TO COMMUNITIES AND INDIVIDUALS THROUGHOUT THE STATE TO SET ASIDE ENOUGH LAND FOR THE EMERGENCY FOOD PRODUCTION PROGRAMME SOON TO BE LAUNCHED IN THE STATE.

Announcing this in Ogoja recently, the Divisional Officer Atuaka, said he has received

letters from Akajuk, Kakwgom, Irruan and Echumofana (Easte Yrnola) clans, offering from 5,000 acres to six square miles of land each, to the Government for the proposed scheme.

He said that many more clans, communities and individuals have indicated their willingness to offer more land to the State Government.

## NEWS

### FOUR AGRIC SHOWS START IN WEST

Some four Agricultural Shows have been arranged to take place in the Western State between this month and next February. The Shows will feature a number of agricultural implements and products.

The first of the Shows starts in Durban School Oyo, (Nov. 20 - 22) followed by the second in Remo Plantation, Ikenne (Dec. 18 - 20). The third is at Ile Oluji Farm Settlement near Ondo (Jan. 15 - 17 1970) while the last will be at Fajuyi Memorial Recreation Centre, Old Race Course, Ibadan, (Feb. 16 - 21 1970).

The Shows are planned to enable farmers in each locality to meet and discuss common problems. But much more important is the competition which will stimulate better production.

The display of agricultural machinery will also be of interest to the farmers who will see how gainful farming can be done without tears through the help of such implements.

# Let us discuss some common rabbit terms

BY A. K. OLUKOTUN

In discussing rabbit, we will always come across some words that we may not have come across while dealing with some other animals. In this article I will try and explain as simply as I can some of such words as they apply to rabbit keeping.

**HUTCH-** The word hutch is used for describing a cage in which a rabbit is housed - usually such cage is designed to provide housing and comfort for the rabbit. The minimum floor space desirable should not be less than 3ft by 4ft in base and not less than 2ft in height for each adult rabbit.

**DOE-** The female rabbit is called the DOE. The female rabbit can be identified by the distinctive absence of testis in adult rabbit and the presence of a slit with a slight depression on the end towards the anus.

**THE BUCK-** The male rabbit is called the buck, and is identified by the conspicuous presence, in the adult rabbit, of a pair of testis. The young buck can be identified by a tube-like projection in centre of a small slit

## SEX DETERMINATION IS EASY AT EIGHT WEEKS OLD

**KINDLE-** When a female rabbit gives birth to

young ones we say it kindles

**LITTER-** The young ones that a rabbit gives birth to are called litters. The number given birth to is often refer-



red to as 'in the case of six - 'Six in the litter'.

**GESTATION PERIOD-** This is the period during which the breeding doe carries its pregnancy - usually 30-32 days.

**RABBIT FUR-** The fluffy hair attached to the rabbit skin is called the fur, Rabbit fur has good market value.

**WEANING-** This is the process by which the young rabbits are separated from the nursing doe at usually six to eight weeks.

**WEANERS-** The young rabbits called litters separated from the

doe after 6-8 weeks described as weaners.

**ROASTERS-** Rabbits bred for table and weighing 6 lbs - 10 lbs and above

**FRYERS-** Rabbit meant for table and weighing



1½ to 2½ lbs are described as fryers. People who like succulent meat find this to be very tasty.

**RABBIT PELLETS** This is the feed made specially for feeding rabbit and containing varying ingredients. The constituent of the pellets varies depending on the manufacturer and is usually about 3/16 in diameter and ¼ long.

**CANNIBALISM** - Sometimes a doe kills its young ones for no apparent reasons and in some cases of nutritional deficiency, the

*Continue on page 15*

## RABBITS

Why not make money during your lax periods. An out-house, a disused garrage or empty backyard can fetch you extra money from rabbits.

### HYBRID

### NORFOLK

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Fast breeding English rabbits produce more than any other breed. Pamphlet on feeding & care given with each order.

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Name & Address.....

Continued from page 13

**RABBITS**

young ones may be devoured. Cannibalism is practised by bucks where they are in a herd and are struggling for supremacy over a doe. In the process of struggling, the bucks may bit each other's testis off. Cannibalism is a bad characteristic which can be stopped by culling (removing) the rabbit with bad characteristics (culprits).

**QUESTION POINT:**

- Q. I LIKE LOOKING AT RABBITS IN THE CAGES BUT I AM ALWAYS AFRAID TO HOLD THEM BECAUSE I AM AFRAID I MAY BE BITTEN.**
- A. RABBI S DO NOT BITE, RATHER THEY SCRATCH WITH THEIR CLAWS AND THIS MAY BE SO PAINFUL THAT YOU MAY BE FORCED TO DROP THE RABBIT BUT IF YOU LEARN TO HANDLE THEM PROPERLY, YOU WILL ENJOY HANDLING RABBITS**

Continued from page 11

**FARMING**

farming that is done in your area.

Go to see the local agricultural advisory officer; he will do all he can to help you, and will advise you well. Finally, find out what services and training your government offers for men who wish to start farming.

A good farmer must be physically fit. He must have good intelligence and a methodical mind, and he must be ready to work hard. Life is good and full for the man who really determines to be a successful farmer.

**WITHOUT ANY DIFFICULTY****HANDLING RABBITS**

**SMALL RABBIT-** Lift small rabbits by grasping between the hips and the ribs. Never

by the ear or neck.

**MEDIUM & HEAVY WEIGHT-** Hold by the fold of skin over the shoulder and support the back with the palm of the other hand

**ITALY:** Anak Italia-Tabor, Italian-Israeli Hatcheries near Rome, is one of the largest and most modern in the area. From this hatchery the Igud distributes to many other European countries, including Eastern Europe.

**S. AMERICA**

Anak-Sudamerica is a joint company founded in Buenos Aires franchised farms and hatcheries investors. This company has established multiplying farms and hatcheries in South America and they receive the primary feeding stock from Israel.

**U. S. A.:** Poultry Breeders International Toms River, New Jersey, is the representative of the Igud in North America, and they are primarily engaged in the sale and distribution of Israel parent stock.

**THE WORKING SYSTEM**

Although it is essentially a commercial firm engaged in a highly competitive business, the Igud maintains its unique cooperative character. The governing body is the annual general meeting of all the member farms, and this body is the final authority.

This general meeting elects an advisory council of 20 members which meets intermittently during the year to hear the reports of the directors and to take broad decisions when necessary.

The activities of the Igud are supervised by the executive committee of seven members which meets once a week. Day-to-day business decisions and functions are managed by two full-time directors.

As in all cooperative associations of this nature, there is a control committee of three members to guarantee that all is in order according to the constitution.

The Poultry Breeders Union includes 17 broiler pedigree farms and 8 egg layer breeding farms. All work is done in close cooperation.

These breeding farms supply the breeding stock for the multiplier-flocks. More than 120 farms producing hatching eggs are associated with the Igud.

**THE BROILER STRAINS**

The Igud developed two different broiler crossbreeds, because it has to meet a wide range of environmental and market demands, which is too much to expect from a single genetic combination.

For markets that emphasize broad-breast, classical broiler conformation and yellowish skin pigmentation, the right broiler is Anak-Cornish. For intensive operation and competitive conditions, where it is necessary to emphasize a fast growth rate and low production costs, for markets that place a premium on light skin and perfect conformation, the right broiler is "Anak"

making sure the legs face upwards or away or sideways to your body. Never by the hind legs.

With a number of practice you would soon become an expert.

**Laying Strains****YANIV. YARKON. YAFFA**

The trade mark of these three excellent egg layers is Isra Hen, the superior egg layer.

**YANIV-** The light white bird for highest net profit. Lays a white shelled egg, has the most efficient egg production and a very high livability.

**YARKON-** The most popular egg layer of Israel. It has the highest egg production, an exceptional livability, and a tinted shell. The Yarkon is a strain-cross between the Yaffa male and the Yaniv Female.

**YAFFA-** Exceptionally docile, very productive reddish-brown layer with large brown eggs. The ideal egg layer for range farming and for markets demanding brown eggs.

**TURKEYS-** The royal white broad-breasted turkey is a strain-cross between an extremely broad male and a fast growing female. This all white turkey gives an extraordinarily high meat yield and can be slaughtered at an early age.

*The Poultry Breeders Union has made a name for itself in the international poultry market thanks to successful performance of its stock and its willingness and ability to meet the market demands and to satisfy the needs of the growers.*

# An 'Impossible' Dream That Came True

by Sam. W. Morris, U. S. Agricultural Writer

**SUMMARY** The cooperative Farm Credit System, started 51 years ago with federal financing, has finally become totally farmer-operated and farmer-owned. It consists of 37 banks and 1,100 cooperative credit associations, and serves 900,000 farmer-members and three million members of cooperatives. It provides credit tailored to meet the needs of individual farmers and help them keep pace with rapid scientific and technological advances in agriculture. The Farm Credit System supplies about one-fifth of all the agricultural credit in the United States today.

vernment's first credit programme, the forrunner of what is today the largest cooperative credit system in the world.

Agriculture, America's largest industry, has always required ever-increasing amounts of capital to keep pace with the tremendous advances in science and technology and to raise the productive efficiency of farms to feed not only the U. S. population but millions of hungry people in food-deficient countries.

## NEEDED HELP

The Farm Credit System has been a major factor in obtaining the credit farmers needed to remain in the business of growing food and fibre. It has played an important part in enabling farmers generally, not just a favoured few, to quickly adopt the latest agricultural advances.

"Credit, tailored to the needs of the individual farmer, is an important agricultural tool in the United States—a tool supplied by organizations that farmers now own completely," Mr. Tootell said.

"This total control and ownership is an truly significant accomplishment. It is an example - proving to the entire world - that people, working together, with a Government sympathetic to their needs, can achieve a dream many once believed to be unattainable."

## "IT WAS A BIG DREAM—AN IMPOSSIBLE DREAM —BUT IT HAS COME TRUE.

**THIS WAS THE COMMENT OF A LEADING AMERICAN BANKER AS HE REFERRED TO THE COOPERATIVE FARM CREDIT SYSTEM (FCS), WHICH HAS AT LAST BECOME EXCLUSIVELY FARMER-OPERATED AND FARMER-OWNED AFTER A 51-YEAR FINANCIAL PARTNERSHIP WITH THE U. S. GOVERNMENT.**

Consisting of 37 banks and 1,100 cooperative credit associations, the Farm Credit System came under sole control and ownership of farmers on December 31, 1968, when it paid about £70 million to retire the remaining Government-held capitals

The System, which serves 900,000 farmer-members and three million members of cooperatives, supplies about one-fifth of all the agricultural credit in the United States today. It provides farmers with about £5000 million credit annually, has about £6000 million in loans outstanding, and has a net worth about £1000 million

"The Farm Credit System," said R. B. Tootell, governor of the Farm Credit Administration, an independent government agency had supervised FCS. "is one of most important assets American farmers had today.

## ASSURANCE TO FARMERS

"It assures farmers and their cooperatives adequate amount of credit on terms suited to their individual needs because the System channels investment funds from the nation's financial

markets to the capital-hungry rural areas where it is needed more and more.

"Success of the Farm-Credit System has been due largely to the ability to set the pace for other lenders. Because it is operated by farmers for farmers, the System is always under pressure to adapt the terms to agriculture's ever changing needs.

Other lenders tend to follow the lead of the System in order to remain competitive.

"The rapid rise in the productive efficiency of U. S. farmers has been due, in large part, to the fact that the Farm Credit System has led the way in providing credit to farmers. A ready supply of credit has enabled farmers to substitute large amounts of capital, much of it borrowed, for labour as new technology has become available.

"A half century ago very few people believed farmers could become their own bankers. Farmers have proved it could be done."

U. S. agriculture is now using more than about £25,000 million in credit compared to about £10,000 million just 10 years ago. Of the £25,000 million, the

Farm Credit System supplies about £6000 million to farmers and cooperatives.

Since 1950 the use of credit by American farmers in traditionally capital-short rural areas has increased almost five times. Economists predict farmers will double their current usage of credit money by 1980.

## THE SYSTEM

The System, consisting of 12 Federal land banks, 12 Federal intermediate credit banks and 13 banks for cooperatives, acquire its loan funds by selling bonds and debentures to the investing public.

The System is often described as "the bridge between Wall Street (the nation's major financial district in New York City) and the farmer."

The U. S. Government, which initially capitalised the Farm Credit System, had a peak capital investment in it of about £320 million in the 1930's.

When Congress passed the Farm Credit Act of 1916, creating 12 Federal lands banks, it established the go-

ORGANIZE A  
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IN YOUR AREA AND INFORM

**FARMSTOCK**

We shall help build it

# nothing but the best for this breeding programme



by  
**ANDREW TOWNLEY**  
*Milk Marketing Board, Surrey*

## 200 BULLS ON ONE FARM

About two-thirds of the cattle born in England and Wales are sired by artificial insemination and about 1,750,000 of these inseminations - or 80 per cent. - are carried out by the Milk Marketing Board, which has the largest A. I. stud in the world.

How does the board choose its bulls and ensure that it gives the best possible service to the farmer?

Obviously, only better than average bulls are used for A. I. To illustrate the A. I. programme, think of an imaginary but typical dairy bull. His story really started before he was born, when a Milk Board livestock officer was studying details of milk-recorded herds. The officer spotted that a particular cow was giving above average milk yields with good butterfat content.

The cow's owner agreed that she could be used for breeding. An independent panel of farmers studied the cow's conformation and records and gave its O.K. The cow was then mated to a top Milk Board bull. So, even before the bull calf's birth, records and conformation had played their part.

### INSPECTED AND APPROVED

Shortly after a bull calf had been born it was bought by the Board and inspected by a Milk Marketing Board veterinary officer. After a satisfactory report the calf was despatched to the board's calf rearing unit.

Visiting breeders inspected him and after two rigorous move him to one of the board's 23 A. I. centres for his test inseminations. During this period his semen was

used to inseminate up to 300 dairy cows. This resulted in a sufficient number of his daughters themselves giving birth to calves, and



*Examining the quality of semen under a microscope at a Milk Marketing Board artificial insemination laboratory.*

Ministry of Agriculture veterinary inspections he was approved to begin test inseminations.

Tests up until now had shown that the bull was a satisfactory type, but it was still not known whether or not he could pass on his characteristics to his progeny.

The next step was to the amount of milk produced by these cows as well as a great deal of other information was carefully recorded.

The testing is elaborate and takes a long time. In fact from the time the bull's first insemination was completed until daughter records became available was some four-and-a-half years.

During that period there were several ways of accommodating the bull - one of the many hundreds of animals owned by the board but temporarily unwanted. He could have been loaned to a farmer to keep and maintain him for the necessary period. Or he could have been "laid off" in premises rented at the Royal Agricultural Centre of England.

But in the event, our bull was despatched to a special lay-off farm owned by the board. This centre, in Yorkshire, can accommodate up to 200 bulls. It was the first farm in Britain to keep large numbers of mature bulls. To the surprise of many, the bulls seldom give more trouble than a herd of cows. In fact the bulls, which are turned out to grass in groups of 20 surrounded by high-tensile wire fences, soon settle down to a steady routine.

To return to the bull after enough of his daughter were milking they were inspected by a panel of practical breeders. When late records showed they were milking well, the bull was at last sent to an A. I. cent and his desirable genes were spread as widely as possible through cattle of his breed.

So much care was taken in the selection of one bull because the board, like every other organisation involved in A. I., realises the tremendous impact which even a bull can have on the nation herd. Semen from one bull can be used to get as many as 50,000 cows into improved techniques and not only that all the same

Continued from page 17

## BREEDING PROGRAMME

used to the best possible advantage but that it can be stored and used long after the animal's death.

Although most of the board's stud consists of dairy bulls, every year beef bulls are used for more than 500,000 inseminations. The same meticulous care is taken over them.

In fact, the Milk Marketing Board has a beef progeny testing station which provides extensive progeny test information on the beef bulls in its A. I. stud.

## ACCESS TO BEST BULLS

In all, British breeders and A. I. organisations invest huge sums of money every year in testing bulls to assess their breeding value. British Semen Exports Ltd. has access to many of the best bulls in Britain. This company exports semen from pedigree dairy or beef bulls to many parts of the globe.

As an extra check, every export of semen is licensed by the Government, who are responsible for investigating and approving the breeding history of the bull and the place where his semen is processed and stored.

Frequent checks are made on semen in store to ensure that the quality is maintained up to the time it leaves the country. Bulls are certified free from brucellosis, vibriosis and trichomoniasis. Government veterinary certificates provided to show freedom from foot-and-mouth disease,

The result is that through the company, semen can safely be bought from the best breeding stock in Britain — and many people feel that it means the world!

# LAUGH !!!

"Laugh and the whole world laughs with you, frown and you wrinkle your face alone."

ON THE day of the championship football match, thousands of vehicles inched to the stands of the stadium. Police waved the cars in and parking attendants squeezed them into narrow spaces. By the time the game was under way, officials were congratulating one another on the way they had handled the traffic.

Then they heard someone crying. It was a woman sobbing at the wheel of a parked car, with her frightened children in the back seat. They asked her what was wrong. "All we were trying to do," sobbed the mother, "was to go to the shop for some bread."

x x x

An arrival at the Iddo Terminal of the Nigerian Railway Corporation, Malam Tanko was lucky to get a porter who went out of his way to help him with his many luggages. As he went out from the railway station he said to the porter. "I am very happy about the way you have helped me with my luggages.

I should have given you some monetary reward, but I see written on your cap N.R.C. meaning, 'not receiving cash'. "Sorry sir, you've got it wrong," said the porter promptly, "it means, never refuse cash."

x x x

THE KING sat in his lounge watching the preparation for an execution. Then the jester opened the door quietly and came in, and as he was going slowly towards the king, the monarch roared at him in anger. "It is of no use coming to me, I shall never grant any of your requests today." Said the king.

Instantly the jester prostrated before the king and said "I implore your imperial majesty to put to death at once that scamp of my," pointing to his cousin. The king, thus caught in his own trap, was obliged to set the condemned man free.

x x x

A game hunter loaded his gun, then took his aim at a large hawk and shot it through the side. From the tall palm tree the bird crashed to the ground with a heavy thud. A man said to him, "you could have saved your cartridge, the fall alone could have killed the bird.

x x x

ONE MORNING my husband shared a bus seat with a pretty young woman who was wearing a scent that struck him as particularly appealing. "I beg your pardon," he said, "but would you mind telling me the name of your perfume? I'd like to buy some for my wife."

After looking him up and down haughtily, she told him. Then, rising to leave the bus, she added, "wouldn't buy it for her, if I were you. If you do, all kinds of strange men will be trying to talk to her."

x x x

A MARRIED man is a bachelor who didn't notice when a girl closed the escape hatch.

x x x

A GANG of clever robbers was busy counting piles of banknotes, booty from a successful bank raid, when one of the counters gasping for breath muttered, "Stop counting, let's ring up the bank and ask how much is missing....."

# FARMSTOCK

## FARMERS' MONTHLY

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### In this edition

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&



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a new birth  
control sys-  
tem for your  
animals p 9





No. 27 JANUARY '71  
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# FARMSTOCK

breeders' & Farmers' Monthly

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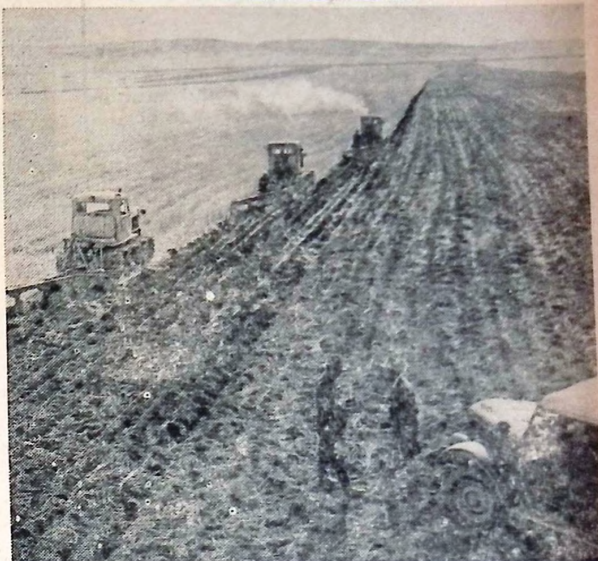
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## PHOTO - NEWS



The people of Sarybastau are engaged not only in livestock breeding. There is wheat, barley, millet and perennial grass being grown on 6,500 hectares of land, of which 2,500 hectares are irrigated. In 1969, the collective farmers gathered more than 20 centners of grain per hectare. The collective farm fully provided itself with seeds and fodder grain, and sold 40,000 centners of grain to the state. Here you see autumn ploughing being done on the farm.



Nusupbek Ashimbayev, first collective farmer and then permanent chairman of the farm, decorated with the Order of Lenin, the country's highest decoration for services in...

## INCENTIVES

The whole country now faces a new 4-Year Development Plan 1971-1974. All sources are whipped into a state of preparedness except the farmer who only listens humbly like a child who is always to be seen and not heard.

But while the child will not be allowed to complain comfort is guaranteed. The same should go to the farmer - this time the comfort will come in the manner of incentives.

Slavish work - hoeing and tilling - is unattractive and unproductive for two reasons. One, it is degrading and two, inefficient. To offset this, simple tools are now available. The farmer may not be able to buy them; the incentive to more production in this context is financial help.

Reaching the market easily and getting needed supplies easily and timely are also very important. In this wise, he needs motorable roads. Surfacing them will be costly now. More and more feeder roads should fan out into the hinterland. It is true farmers have been grouped into cooperatives which should rebuild the bush-paths into motorable ones, nevertheless they have to be activated by some official incentives either in the provision of a road grader or technical assistance.

Simple storage facilities are also very important. At present the farmer is forced to sell off his products shortly after harvest not because he likes it so but because he wants to avoid loss due to pests and weather. But nobody benefits either. When he rushes to the market shortly after harvest, a glut follows, even some of his produce rot while prices fall to the farmer's dislike. Shortly after however scarcity comes in with all its known attendants.

Storage facilities will even out all this inconvenience. The farmer can then spread out his selling. He will produce more and sell evenly. Prices will be stable.

We can go further writing about possibilities. Since we all know these things, why cannot the big man in the big place be pushed into action and relieve ourselves of hunger?

Unfortunately we cannot do otherwise. If the 4-year Development Plan is to succeed we have to eat first; this is why the farmer is an important figure in this bid. He needs INCENTIVES quickly

## LETTERS

### FOOD FOR ALL

Dear Sir, I appreciate your precision in the editorial of the December '70 issue of the Farmstock.

I wholly agree with your proposal to the Federal Government to follow the exam-

ple of Sierra Leone by purchasing tractors and other agricultural machines en masse for the use of our farmers.

### HELPFUL HINTS

Dear Sir,

The article titled "The Salmonella Bacteria" which appeared in the December '70 issue of your magazine was most educative.

I had lost some chickens through one of these diseases. This was due to my ignorance of the nature of the disease and the treatment applicable. Safeguard against further loss has been secured however. I have also cleaned up my poultry farm to avoid the existence and spread of the bacteria.

For personal safety I have adopted more careful methods in my purchase of fish meal which is regarded as one of the sources of the Salmonella disease.

I hope the Editor will feature more of these articles.

Odogbolu

A. Ajibola

Ikeja.

Miss. Subu Adelowo.

### WAGES REVIEW

### ARE FARM WORKERS INCLUDED?

Dear Sir,

THE PLIGHT OF FARM WORKERS HAS FEATURED IN THE NOVEMBER AND DECEMBER '70 ISSUES OF THE FARMSTOCK

The Adebos Salaries and Wages Commission has recently secured an Interim Award for workers generally. The inclusion of the farm workers has not been specified in the scheme. They are likely to suffer lower standards of living since prices of goods and food-stuffs are likely to rise.

the scheme and a better treatment than what they are receiving at the moment. It is this lack of high remuneration to farm workers that drives away young school leavers from the farms.

Their case should be looked into as soon as possible to guard against discontent and its attendant evils.

Surulere

S. Banjo

The fact that Nigeria is an agricultural country necessitates their inclusion in

Continue on page 8

by Leslie J. Elmslie M. A. (Cantab)  
Specialising in Agric.  
Technical Director, Ejinaka & Thornbers Ltd.

## DISEASES OF POULTRY

# FOWL POX

**F**OWL POX IS A VIRUS DISEASE OF POULTRY, WHICH MAINLY AFFECTS CHICKENS, BUT CAN ALSO OCCUR IN TURKEYS, PIGEONS, GUINEA FOWL, AND QUAIL. DUCKS AND GESE ARE NOT AFFECTED, NOR ARE HUMANS NOR ANIMAL. IT IS ONE OF THE OLDEST KNOWN DISEASES AND CAUSES LOSSES IN MOST COUNTRIES.

The most typical symptoms are pox marks on the comb and wattles. These marks start as small grey-white spots, which grow rapidly, and turn yellow. There may be few or many. In severe cases the bird's head may be covered in rough, wart-like growths, which may also be found under the wings, round the vent, or on the legs and feet.

In time the pox marks dry into brown scabs surrounded by red inflamed areas. After a few weeks the scabs drop off, leaving a smooth scar, unless bacteria have entered the site, when the whole is more severe.

### AREAS OF INFECTION

In some birds the virus grows in the cells lining the

mouth and throat, causing yellow-white nodules which grow rapidly, and may become thick enough to interfere with eating. Similar growths may come in the sinuses, and interfere with breathing, or in the eyes.

The effect on growth and production depends on the extent of the disease in each bird. In some flocks the disease spreads rapidly, and in others quite slowly. Wounds caused by sharp pieces on the cages or equipment may increase the spread of the disease.

### DIAGNOSIS AND PREVENTION

Diagnosis can usually be made by inspection of the birds. Laboratory methods can be used if there is doubt, and include the examination of thin slices of the comb to look for "inclusion bodies" which are typical of Fowl Pox.

Another method is to apply diseased material to the comb of a susceptible bird to see if it gets the typical pox.

There is no cure for Fowl Pox. Good husbandry will generally reduce the effects of the disease, otherwise it must run its course.

Prevention is by vaccination. A live virus vaccine is used, and is applied to the wing web by jabbing it with a two pronged needle which has been dipped in suspension of the virus.

Because the virus is applied by such an unnatural route as the wing web it does not produce the di-

sease, but does produce an immunity, which should last for the life of the bird.

### WHEN TO VACCINATE

The vaccination is best made between six and twelve weeks for best results. If it is used before six weeks the birds' immunological system is not fully developed, and so the immunity produced is weaker.

By twelve weeks the bird ought to be protected. However there are no rigid limits. For example the vet may advise vaccination earlier than six weeks if he considers the risk of early infection great.

Again the time may be planned to fit in with other vaccination.

Fowl Pox virus is exceptionally long lived outside the bird. A survival period of twelve months has been quoted in some conditions. There are related Pox viruses, which take their name from the bird most commonly affected by them: Fowl Pox, Turkey Pigeon Pox, and Canary Pox.

Each virus can infect a species of bird, but more mildly than its own kind. An attack of one virus will give the bird partial immunity against attack by other kinds.

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WANT TO RAISE BROILERS ?

# THEN NOTE THESE POINTS

**S**TRIGHT-RUN CHICKS ARE GENERALLY USED FOR RAISING BROILERS. GROWTH RATE AND FEED CONVERSION DO NOT SEEM TO BE MATERIALLY DIFFERENT IF THE SEXES RUN TOGETHER OR SEPARATELY. COCKERELS GROW MORE RAPIDLY AND CONVERT THEIR FEED MORE EFFICIENTLY THAN PULLETS AND ARE MORE PROFITABLE TO RAISE.

Being heavier at a given age, there is more weight over which to spread chick and contract fixed costs. Very little convincing data are available that the advantages of separating the sexes, if any, offset the costs involved.

Since the demand has been for only white-feathered broilers, there has been very little interest in the sex-linked crosses, which facilitate separating the sexes.

by  
Our poultry  
Correspondent

hatching time.

## BREEDING METHODS

The science of genetics has been and is being continuously utilized to improve broiler breeding stock. Hybrid vigour is obtained by systematic matings that may involve crossing of different



strains of the same breed, or the crossing of inbred lines.

In addition to hybrid vigour, improvement in economic factors often results from these crosses provided the mating includes stocks having superior qualities of genetic origin.

The end product—our modern white, yellow-shanked broiler—is often obtained by crossing the male lines from specialized breeders with female lines produced likewise by specialists.

Each line may be the result of crossing two or more strains. The male lines usually have dominant white feathers and are selected for rapid growth; meat characteristics, such as breast width, body depth, live market grade, and dressing yield; and rapid feathering.

The female line also must have outstanding growth rate, high hatchability, and good, but not outstanding, production of eggs of desirable size and texture. Considerable attention has been given recently to additional factors, such as free-

dom from *Mycoplasma gallisepticum*, feed efficiency, skin texture, skin and shank pigmentation, and, in the case of large broilers, roasters, and capons, feathering on the breast or absence of breast blisters.

If male and female lines are produced by different breeders, as they often are, each line must, to remain competitive, cross well with other lines. Progeny test and family selection have been effective in the development of broiler lines.

The buyer must judge the ability of male and female lines to cross well, whether the lines are developed by separate breeders or the same breeder.

The selection of a commercial broiler stock can be the determining factor between profit and loss. Extension poultry specialists and county agricultural agents can provide information that will be helpful in making the selection.

The results obtained by other growers in the area

Continue on page 18

## EVERYTHING FOR POULTRY

DAY OLD CHICKS, TURKEYS, LAYERS AND BROILERS IMPORTED EVERY WEEK BY AIR. METAL CAGES, FEEDERS, BROODERS, INCUBATORS ACCESSORIES, DRIERS, HAMMERMILL FEEDMIXERS AND SILOS.

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KANO KADUNA PORT HARCOURT

## ADVERTISEMENT

# WORM INFESTATION IN POULTRY

DO YOU ALWAYS REALIZE THAT WORMS CONSTITUTE A BIG THREAT TO YOUR PROFIT MARGIN FROM POULTRY AND PIGS? HERE ARE SEVERAL WAYS IN WHICH WORMS (ASCARIDS) ADVERSELY AFFECT YOUR ANIMALS AND THEREBY DRAIN AWAY YOUR MONEY.

1. Reduced vitality and increased susceptibility to diseases like pneumonia, gastritis, and anaemia.
2. Intestinal upsets such as diarrhoea or even blockage of the intestinal track by worms when present in large numbers.
3. Loss of egg production in poultry.
4. Reduced growth rate, your poultry take a longer time to reach profitable point of lay.
5. Increased mortality from worms and diseases which are aggravated by them.

You all know that when animals are healthy, they are able to withstand diseases more than when they are weak. At certain stages of the worms' life, they feed from the blood of the hosts (birds) while at other stages, they live directly on the food which their hosts have eaten.

Different stages of growth of worms are found in different parts of the animal's body - in the liver, heart, lungs and finally adults and eggs in the intestine. In all these body organs, the worms can cause severe damage. The havoc which worms have been causing in your poultry and pigs is now very clear.

These symptoms will help you to suspect that your poultry is infested by worms: Growth retardation, pneumonia, gastritis, anaemia, reduced egg production, loss of vitality, increase mortality.

## CLEAR WORMS WITH GLOBE PIPERAZINE WORMER:

By using Pfizer Globe Piperazine Wormer, you can avoid the problems enumerated above. Here is how to make the wormer work:

### (a) POULTRY: 4 - 6 WEEKS

Use 2 table spoons (1 fluid ounce) per 2 gallons of drinking water for one day.

**ABOVE 6 WEEKS:** Use 4 table spoons (2 fluid ounces) per 3 to 4 gallons drinking water. Repeat the following day.

### (b) PIGS AND HORSES:

Use 2 table spoons per 100 lbs. body weight as a drench or mixed into palatable feed. Dose pigs just before weaning or 4 weeks prior to farrowing.

*N. B. Do not give any feed or water until the medicated ones have been consumed. Repeat the above dosage one month later in order to clear out the worms completely.*

*Also, remove litter after deworming so as to avoid reinfestation. And because deworming imposes a stress on your animal, give TERAMMYCIN (Oxytetracycline hydrochloride) Soluble Powder for at least 2 days before deworming and continue for a minimum of 3 days after this operation in order to overcome the stress.*



**N  
E  
W  
S**

**AGRIC  
SHOWS IN  
GUSAU  
AND YABO**

**CAMPING AT  
MINNA**

A 3-day camping was held by the Young Farmers Clubs at Minna recently.

Over 100 delegates from far and near attended the camping. The top officers of the Farmers Clubs also graced the occasion.

Discussions on various agricultural topics were held. Lectures were given by some of the officers on the need for mutual understanding among the various farmers Clubs.

The annual Agricultural shows in Sokoto Emirate were held recently at Gusau and Yabo respectively.

Many eminent personalities and local government officials attended the shows. The shows drew a large crowd from all walks of life, who expressed their satisfaction at the exhibitions.

Many farm products were displayed. Some livestock products were also on show. The presence of officers giving useful hints to attendants at the show added to the success of the show.

Would-be investors in various livestock products benefitted a lot from the shows.

**LETTERS** *Continued from p. 4*

**AN EGG IS AN EGG**

Sir,  
I wish the Editor would let me through as regards the qualities obtainable in eggs produced by local flocks through mating and produced by poultry which wish same provided the local hens and their chicks when con-

I shall be most grateful if these points are clarified in your next issue of the Farmstock.

**Idoani Wasiu Hakeem**

*Editor's Note :*

The nutritional value and taste of an egg is the same whether it is obtained from a local hen or the scientifically raised. The mating only adds to the sperm which is the male part responsible for the chick to be.

**HORTICULTURE**  
— GARDENER

The art of growing and raising vegetables as old as the hills. In times past, even the family needs different types at least to bring about natural changes, it is not uncommon to see different types of vegetables vying for dear space on a small piece of land. As the population is usually limited, so too is local de-

Even many a villager cares less about growing his need since his family can always get fresh, large-leaved vegetables from the refuse-heap.

A general saying has it that vegetables from the refuse, dust or dung heap are usually tastier than those from the backyard. What say you to this phrase?

**SPECIALISATION**

With the growth of towns and workers' settlements it has become necessary for a class of farmers to specialize in the production of vegetables to serve the high demand. This speciality is termed HORTICULTURE since the plots are usually in garden form. Because the business is usually located near and timed for markets it is often termed market-gardening.

Though horticulture is an aspect of farming, it is the one with the least training period i.e. 3-4 days. A few hints sets you on the way to success as you watch your vegetables take shape just as your instructors had said.

Vegetables are as many as the quantity of sands in granny's palm but the commonest species are Tete (Spinach) Igbo, Soko and Ila (Okro). A good Euro-

pean population reach may justify the inclusion of cabbage cauliflower and but unless you are your market, rest yourself to the vegetables.

**SPACE**

If one is lucky plenty of space, a plot may be divided into beds of 6 or 8 ft by each and the seeds sown in rows. Don't sprout anyhow please. This treatment allows for weeding and harvesting later. The tables are ready for market anytime from 1 month depending on treatment and soil.

Vegetables are very important food items to both human and animals. They contain iron and other trace minerals. These are good for bones and blood. Hence the doctor's or nutritionist's advice to the convalescent and mothers to eat plenty of vegetables.

With water and a good soil, your garden can always have a good crop of vegetables for the market. The size of the farm (garden) determines the marketing.

But you must be picking the vegetables regularly because they are not all likely to be

*Continue on p. 22*

## PUTTING ANIMALS ON

## "THE PILL"

FAMILY PLANNING IS BY NO MEANS CONFINED TO HUMAN BEINGS THESE DAYS. IN BRITAIN VARIOUS FORMS OF "FAMILY PLANNING" OR BREEDING CONTROL OF ANIMALS ARE WIDELY PRACTISED, EITHER FOR ANIMAL WELFARE OR ECONOMIC REASONS - OFTEN FOR BOTH.

The most recent form is the introduction of an oral contraceptive for dogs - a birth pill which has many advantages. It is the first satisfactory oral method of birth control found for animals, and as there are some 4,000,000 dogs in Britain it has enormous potential.

#### Unwanted Puppies

Perhaps its most important function will be to prevent the birth of many thousands of unwanted puppies - the result of unplanned mating - that are destroyed every year soon after they are born.

The pill suppresses "heat" and the often distressing and inconvenient problems it brings. It also prevents conception should mating occur.

Giving the course of treatment to a bitch enables the owner to control her breeding and to space her litters. A longer course will postpone "heat" to avoid interference with holidays, travel or dog shows.

As the pill has a yeast base it is readily eaten, and tests on 250 bitches before it was marketed confirmed that it had no serious side effects. However, correct dosage and administration are vital, and because of this the pill is available in Britain only through veterinary surgeons.

by  
**Peter Bullen**  
*Agric Correspondent of  
"THE DAILY MAIL"  
London.*



*Ovarid, Glaxo's new contraceptive pill for dogs, being administered to an Alsatian bitch.*

#### Sponge Pessary For Sheep

On farms, synthetic hormones to control breeding in sheep have been used for two years. A device was first marketed in April 1967 after tests on 5,000 ewes from 18 different breeds had shown that "family planning" could make a valuable contribution to sheep rearing in some conditions.

The device is a small sponge pessary, impregnated with the hormone, which is placed inside the ewe's genital tract and enables the shepherd to plan the breeding of the flock with precision.

All the ewes can be persuaded to mate and eventually to lamb at the same time, so that lambing lasts for a few days instead of straggling on for weeks.

For countries which have a large sheep population, particularly if artificial insemination is being used, the ability to control the breeding pattern of ewes could be very beneficial.

Apart from the value of condensing mating and lambing times and making the breeding pattern more predictable, the method has another advantage in countries where sheep are reared for meat. It enables the breeding season to be brought forward by several weeks so that the lamb crop arrives before the traditional time.

As early-season lamb price are generally the highest it could pay some flock owner to be first to market with their lambs. Of course, if everyone switches to early marketing the advantage rapidly disappears.

#### More Rams Needed

Results with sheep have been inconsistent in Britain, probably because of the large number of different breeds - there are more than 40; but there would not be such a drawback in countries where there are fewer breeds.

The technique of controlling or synchronising oestrus or "heat" in ewes also makes it necessary to have one ram for every ten to 20 ewes.

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# panorABIC

## INTRODUCTION

SODIUM AND CHLORINE ARE NUTRITIONAL ELEMENTS THAT FULFILL ESSENTIAL PHYSIOLOGICAL NEEDS OF POULTRY. EXCESS AS WELL AS LACK OF THESE ELEMENTS IS HARMFUL JUST AS WITH OTHER REQUIRED NUTRITIONAL INGREDIENTS. D. G. BRITZMAN (1968) SUMMARIZED THE LITERATURE ON THE EFFECTS OF EXCESSES AND DEFICIENCIES OF NaCl FOR POULTRY.

Results of excess NaCl are:

- Lowered feed consumption
- Lowered rate of egg-laying
- Increased water consumption.
- Increased moisture excretion - wet droppings
- Edema - especially in chicks
- Stress on internal organs - especially on kidneys.

Conversely, added Sodium (Na<sup>+</sup> ions) increases shell strength if the amount of ingested Chlorine is restricted. This is due to induced mild metabolic alkalosis which has a positive affect on Calcium deposition in the uterus - hence on egg shell strength and quality.

In Israel nearly all layers, replacement pullets, Leghorn breeders, and most broilers are kept in cages in rural areas, and in close proximity to living quarters. Wet

droppings and wet litter are nuisance due to:

- Unpleasant odours generated
- Breeding of numerous flies
- Difficult disposal of manure
- Worse still are the problems of poultry sanitation, prevention and control of disease.

Excess moisture results from excess water consumption. We found that birds in the summer heat drink not double the amount of water as of feed but four times as much and more. Turkeys were consuming 6 to 7 times the amount of water as of feed.

The quantity of water consumed and excreted is a function of the mineral intake contributed by both feed and drinking water.

In checking the predominant minerals Sodium (Na), Potassium (K), Chlorine (Cl) which might possibly be in excess, we discovered that in our normal feed formulations Chlorine is in preponderant excess as well as in imbalance with Sodium. (See tables 1 - 2).

To this excess in the feed should also be added the Chlorine level in the drinking water. The Chlorine level in the water rises sharply in the summer months and in many areas reaches to over 500 p.p.m. while the Sodium level hardly changes - about 100 p.p.m. That Chlorine is consumed in great excess becomes quite clear. (See tables 3-4) (pp. 13 & 14)

The recommended allowance for Chlorine ranges from a maximum of 0.15% in the feed (see M. L. Scott) to the much lower 0.06% Chlorine recommended by the Agricultural Research Council 1963 - London. The Sodium requirements recommended vary but little - from 0.11% to 0.15%.

**ABIC is an Israeli pharmaceutical Company which has made available to FARMSTOCK a number of topical features on additives, concentrates and veterinary medicines.**

P. Mongin (1968) in his review on the role of acid-base balance in the physiology of egg shell formation, stresses the development of metabolic acidosis resulting from excess Chlorine (Cl<sup>-</sup> ions) and its inhibitory effect on deposition of Calcium in the uterus during shell formation

discusses:

## EXCESS CHLORINE IN POULTRY FEEDS - REPLACEMENT OF SODIUM CHLORIDE IMPROVEMENT OF SODIUM : CHLORINE RATIO

### what are the effects of excess of chlorine?

A. The bird receiving excess Chlorine must call upon its metabolic reserves in order to remove the excess from its body. This is accomplished via the renal system - the kidneys - and entails the excretion of a greater quantity of liquid with a resultant larger intake of water. In practice this means wetter droppings.

B. The higher concentration of chlorides in the body is an important factor in the acid-base balance of body fluids. The buffering of acidosis in intercellular fluids is accomplished mainly by bicarbonate ( $\text{HCO}_3^-$ ), phosphate and plasma-protein. Of these the bicarbonate is quantitatively the most significant.

Work done mainly in France indicated a close relationship between the concentration of  $\text{Cl}^-$  ions

(Chloride) and bicarbonate in the blood i. e. excess Chloride lowers the bicarbonate level and thus lowers the ability to neutralize acidosis.

This creates a certain internal stress and the body must recruit its other metabolic mechanisms to prevent excess lowering of the pH of body fluids.

This is especially significant for layers since the resultant lower level of bicarbonate ( $\text{HCO}_3^-$ ) in the blood adversely affects the deposition of Calcium in the uterus and thus a weaker egg-shell (See Mongin 1968).

From the above discussion it follows that excess Chloride should be prevented. This can be accomplished by removing part or all of the

table salt ( $\text{NaCl}$ ) and adding other sodium salts that would not contribute to the Chlorine content while effectively supplying Sodium.

The use of sodium sulfate was not feasible since the sulfate ions are diarrhetic and would defeat the intended purpose. The use of sodium citrates, sodium bicarbonate was possible. However, these salts are very basic and if incorporated into the vitamin premix or the finished feed would be deleterious to the vitamin content.

We found that the different sodium phosphates in appropriate combination at a neutral pH were most appropriate. They are excellent buffers and their presence in the vitamin premix even improves the

stability of these fine ingredients.

In addition, the use of sodium phosphates gives us added important advantages.

- They are more economical since they supply not only Sodium but also Phosphorus - (see table 6).
- They supply nutritionally highly available phosphorus (P).

To test the actual effect on the birds of the removal of part of the excess Chlorine from the ration without changing the Sodium level through the addition of sodium phosphates - a number of trials were carried out at the Abic Experimental Farm.

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THE ESSENTIALS OF AG

# FARMERS NEED

**IMPROVED FARM PRACTICES, ACCESS TO MARKETS FOR FARM PRODUCTS AND THE AVAILABILITY OF SUPPLIES AND EQUIPMENT — THESE PROVIDE OPPORTUNITIES FOR FARMERS TO INCREASE PRODUCTION, BUT WILL THEY USE THEM ?**

Here we must go back to the nature of the farmer. He is a person managing a business. As a person he wants his family to be well cared for and he wants a respected place for himself and his family in the community.

Being a farmer, he must seek to reach these goals through his farming.

At early stages of the commercialization of agriculture he is interested first in seeing that his family has enough to eat, and wants to guarantee this by producing at home.

To meet the other needs of his family, he wants to sell high products that he can pay his taxes or his rent, make payments on his debts, buy necessities he cannot produce for his family.

Additional goods and services become available in the locality he wants to obtain some of these for his education for his children, medical services, and

clothing, radios, better household furnishings and special kinds of food.

To accomplish these aims through his farm business he must pay close attention to costs and returns. He must sell products worth more in the market than it costs him

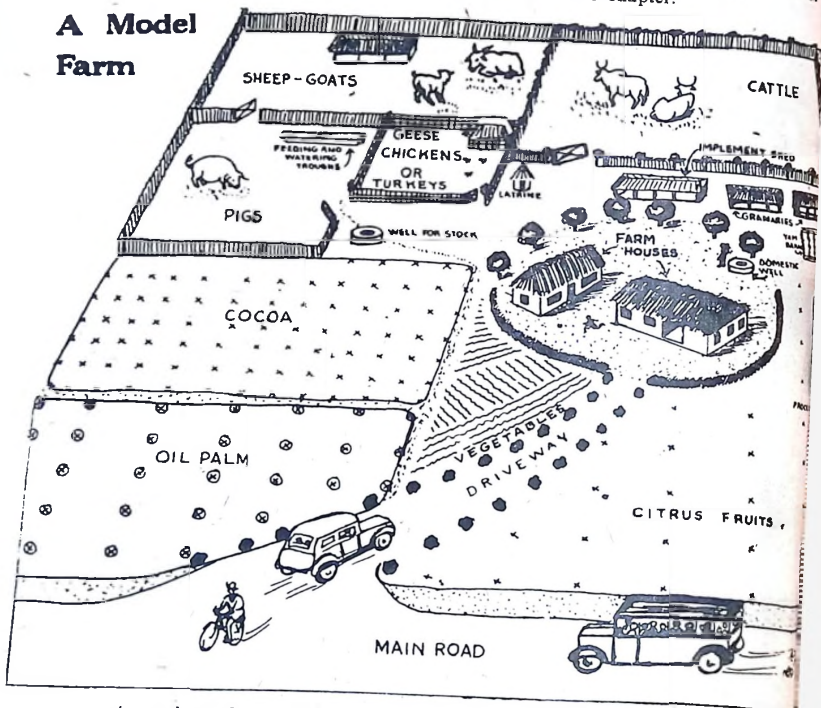
farmers to increase their production are primarily economic :

1. remunerative price relationships
2. a reasonable share of the harvest
3. the availability of

strongest economic incentives to farmers.

There are other incentives besides economic ones. Farmers want respect and recognition from their friends and neighbours. We shall come back to this at the end of the chapter.

**A Model Farm**



*A modern farm, this arrangement can be rearranged according to*

to produce them. The margin between costs and returns, the farmer's net income, must keep increasing if he is to be able to give his family a rising level of living.

goods and services that farmers would like to be able to purchase for themselves and their families.

But the most important incentives are economic and we shall discuss them first.

**REMUNERATIVE PRICE RELATIONSHIPS**

To the extent that a farmer produces for the market, his

Thus, the incentives that are effective in getting All of these, together in combination provide the

DEVELOPMENT (5)

(PART 1)

# INCENTIVES

by

## Our Farming Correspondent

...tive to increase produc-  
...depends on the relation-  
...between the price he  
...receive for his product  
...the costs of producing  
...These costs of production  
...influenced by the price-  
...must pay for purchase in-  
...ces for farm products.

...available, the higher the price  
...offered to farmers for a par-  
...ticular farm product, the  
...more of it they will produce  
...and bring to the market.  
...Many people do not believe  
...this, and government policies  
...often are based on the assum-  
...ption that it is not so.  
...Where evidence is cited to

...farm products is not the only  
...essential for development but  
...it is an important one.

...prices fluctuate widely within  
...each year, with prices usually  
...lowest just after harvest time.  
...Most farmers do not have  
...facilities for storing their crops  
...without losses due to insects  
...or spoilage.

...A recent series of studies  
...in the State of Punjab in  
...India revealed that farmers  
...there shift from producing  
...one crop to producing  
...another in response to price  
...changes to at least the same  
...degree as do the highly com-  
...mercial farmers of the  
...United States.

...Also, they are usually short  
...of cash and need to sell as  
...soon as they can. Hence,  
...many farm operators feel  
...compelled to sell their pro-  
...ducts immediately after harvest  
...and this is one reason why  
...prices are lowest at that time.

...Similarly, there is increasing  
...evidence that farmers seek to  
...increase the production per  
...acre of a particular crop when  
...the price of that crop rises,  
...particularly by purchasing  
...increasing amounts of fertilizer  
...for use on the crop.

...Prices of farm products  
...fluctuate also from year to  
...year, depending on how big  
...the harvest may have been in  
...the previous year, on what  
...carry-over stocks are on hand,  
...and on the prospects for the  
...harvest in the current year.

...In Indonesia, where prices  
...of farm products had been  
...held down, controls were  
...abandoned in 1964 and prices  
...allowed to seek their own  
...level. Farm prices shot  
...up. Farmers became more  
...interested in fertilizers and  
...improved seed.

...Unfortunately, fluctuations  
...in agricultural product prices  
...are likely to be particularly  
...great just at that stage in  
...agricultural development when  
...farmers need to begin to sell  
...more and more of the pro-  
...ducts of their farms.

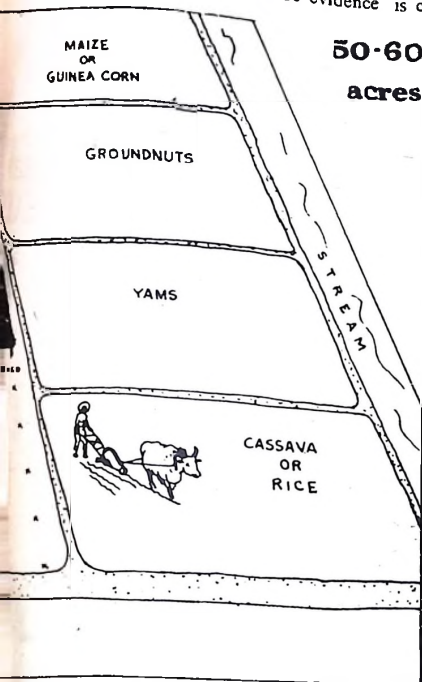
...Land was farmed more in-  
...tensively and larger amounts  
...of rice, corn, vegetables, and  
...other cash crops came on the  
...market.

...Where most of the popula-  
...tion is still on farms, so that  
...the domestic off-farm demand  
...for farm products is still re-  
...latively small, modest increases  
...in production can have large  
...effects in pushing market  
...prices down.

...Farmers do respond to mar-  
...ket prices, and if a country  
...wants agricultural develop-  
...ment the prices offered to in-  
...dividual farmers must be fa-  
...vourable.

...Furthermore, marketing  
...facilities needed for transport-  
...ing, storing, processing, and  
...other handling of the increas-  
...ed supplies usually are slow  
...in developing. This tends

...The dependability of prices  
...for farm products is as im-  
...portant as their level.



50-60  
acres

...area and type of land available.

...the level and the depen-  
...of prices for farm  
...influence the degree  
...they provide incen-  
...farmers to increase  
...ion.

...prove that prices do not  
...matter, it is almost always  
...found, on examination, that  
...the reason lies in the fact that  
...one or another of the other  
...essentials for agricultural deve-  
...lopment has not been met.

...other essentials for  
...development are

...A remunerative price for

...Most agricultural products

**panorABIC**

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TABLE 1.

LAYER FEED - R. I. R. x Leghorn Layers -  
SODIUM and CHLORINE CONTENT \*\*

Feed Ingredients	%	Sodium (Na) kg.	Chlorine (Cl) kg.
Corn	10.0	0.010	0.040
Milo	53.8	0.054	0.430
Wheat Bran	4.0	0.024	0.016
Soya Oil Cake	17.0	0.408	0.119
Fish Meal	3.5	0.063	0.144
Oil or Fat	0.7	—	—
Alfalfa Meal	1.5	0.023	0.042
Limestone (CaCO <sub>3</sub> )	8.1	—	—
D.C.P.	0.8	—	—
Salt (NaCl)	0.3	1.200	1.800
Vitamin Premix *	0.3	—	0.040
Total	100.0%	1.782 kg. 0.18%	2.631 kg. 0.26%

\* Vitamin Premix containing Vitamins (including 400 g. Choline Chloride), Trace Minerals, Antioxidant, (Ethoxyquin), Methionine.

\*\* According to Mornson, F. B. - Feeds and Feeding 1959.

TABLE 2.

SODIUM AND CHLORINE CONSUMED BY LAYERS  
(R. I. R. x LEGHORN)  
VARYING WATER CONSUMPTION\*

Source	Water consumed-- 260 cc.		Water consumed-- 520 cc.	
	Sodium (Na) mg.	Chlorine (Cl) mg.	Sodium (Na) mg.	Chlorine (Cl) mg.
Feed Ingredients	130 g./feed/day	76	108	76
Salt (NaCl)	156	234	156	234
Water	260 cc./day	26	52	—
Water	520 cc./day	—	—	52
Total	358	394	384	446

\* Average analysis of water - Sodium (Na) 100 p.p.m.  
Chloride (Cl) 200 p.p.m.

TABLE 3.

SODIUM AND CHLORINE CONSUMPTION  
VARIOUS RECOMMENDED LEVELS

Source	Recommended level in feed Sodium (Na) %	Recommended level in feed Chlorine (Cl) %	Absolute requirement in 130 g. feed/day	
			Sodium (Na) mg.	Chlorine (Cl) mg.
Prof. Scott (1968)	0.15	0.15	195	195
Agric. Res. Council (Eng.)	0.11	0.06	143	78
Nat'l Res. Council (USA)	0.14	No recommendation	182	No recommendation

TABLE 4.

COMPARISON OF SODIUM AND CHLORINE  
REQUIRED TO SODIUM AND CHLORINE  
CONSUMED IN FIELD CONDITIONS

	Daily Requirement mg.	Actual Daily Consumption mg.
Natrium (Na)	143 — 195	258 — 284
Chlorine (Cl)	78 — 195	324 — 446

TABLE 7.

LAYERS — R. I. R. x LEGHORN  
DIFFERENT LEVELS OF NaCl — FIRST TRIAL

Dietary NaCl — kg./ton	4 kg.	2.5 kg.	1 kg.
Rate of Lay %	72.5	73.6	72.6
Average weight of egg (end of trial) g.	61.0	60.9	60.1
Average weight of egg (start of trial) g.	56.5	56.3	55.1
Increase in weight of egg g.	+ 4.5	+ 4.6	+ 5.0
Amount of feed per egg g.	135	131	122
Final body weight g.	2380	2350	2390

TABLE 5.

LAYERS — R. I. R. x LEGHORN  
TWO LEVELS OF NaCl — SECOND TRIAL

Dietary NaCl — kg./ton	3 kg.	1 kg.
Rate of Lay %	68.6	68.4
Feed consumption per day g.	126.4	123.2
Feed per egg produced g.	184.6	180.2
Body weight at start g.	2280	2220
Final body weight g.	2370	2370
Added body weight g.	90	150

TABLE 8.

BROILERS — TWO LEVELS OF NaCl

Dietary NaCl—kg./ton	3 kg.	0.5 kg
Final weight of broilers g.	1512	1525
Weight of bird at start g.	893	823
Added weight g.	621	632
Feed consumed g.	1920	1940
Feed efficiency g.	1:307	1:309

TABLE 6.

COST OF SODIUM IN VARIOUS SODIUM SALTS

Salt	Quantity	Sodium (Na)	Phosphorus (P)	Price
	kg.	kg.	kg.	IL.
Table Salt (NaCl)	Na 40%	3.0	1.2	0.18
Sodium Bicarbonate (NaHCO <sub>3</sub> )	Na 27%	4.5	1.2	1.80
Sodium Phosphates	Na 27% ]	4.5	1.2	0.864
	P 19.2% ]			
Dicalcium Phosphate	P 17%	5.1	—	0.867
Net cost of replacing Sodium by sodium phosphates				0.51

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Continued from page 15

## experimental trials and results

The first trial was carried out with R.I.R. Leghorn layers in cages - 2 birds per cage. Each treatment consisted of four replicate groups of 10 birds each. The trial lasted one year. The highest level of NaCl was 4 kg./ton, in the other groups the NaCl removed was replaced by sodium phosphates - the Sodium, Phosphorus and Calcium levels remained constant by appropriate adjustment of the D.C.P. and CaCo<sub>3</sub> levels in the ration.

Results are presented in Table 7. There were no differences between the treatments in bony weight, egg size or rate of lay. However, since feed consumption was lower as the level of salt decreased, a better feed efficiency was obtained.

In addition the droppings of the lower salt groups appeared to be less wet. In this trial it is clear that even in feed containing only 1 kg. of table salt there was clearly no lack of Chlorine.

The second trial was carried out during the sum-

mer heat - on R.I.R. x Leghorn layers, 9 months old at start of trial. The birds were assigned to ten groups of twelve each, five replicate groups per treatment, and records were kept of rate of lay, feed consumption, feed per egg laid, and increase in body-weight.

The two dietary treatments included supplementation with NaCl at a rate of 3 kg./ton, and 1 kg./ton Sodium, Phosphorus, Calcium balanced as above by addition of sodium phosphates and calcium carbonate while decreasing the D.C.P. Results are presented in Table 7.

This trial confirmed the results of the first trial - there was no change in rate of lay. Groups on the ration containing only 1 kg. NaCl consumed 2.6% less feed and feed-efficiency (feed per egg produced) improved by 2.5%

Despite lowered feed intake the weight increase of birds on the low NaCl ration was greater than that of the higher NaCl groups. It is difficult to determine

accurately the relative condition of droppings under field conditions. However, the consensus was that droppings of the low NaCl groups were more solid than of the other groups.

Another trial was carried out with male-broilers from the age of 5 through 9 1/2 weeks. Four replicate groups received feed with 3 kg./ton NaCl, while other four replicate groups received 1/2 kg./ton NaCl. Sodium, Phosphorus and Calcium were balanced as in other trials.

Results are presented in Table 8.

The results show conclusively that decreasing the Chlorine content while keeping the Sodium, Phosphorus, and Calcium unchanged had no negative effect on the growth of the broilers. To the contrary, there was even a slight improvement in efficiency. However, it would seem that the effect is less obvious with young birds than with the larger older layers.

## CONCLUSIONS

Results of the above trials clearly proved that a decreased level of salt (NaCl) in the feed - the purpose being to prevent the negative effects of excess Chlorine - while keeping the level of Sodium unchanged by supplying it via sodium phosphates - clearly had no negative effect on the achievements of the birds.

In all the trials there was even a tendency for improve-

ment of results, especially in layers. It is entirely possible that the improved feed conversion was due to improved acid-base balance in the body fluids. It is reasonable to believe that this improved acid-base balance will also improve egg-shell quality.

In all trials droppings were firmer (less wet) as the amount of salt in the feed was decreased.

**INCENTIVES**

*Continued from page 13*

particularly to depress prices in local markets at harvest time.

Previously farmers have produced primarily for home consumption. Now, just when they must rely on market prices of their products in calculating costs and returns, they are faced not by stable and predictable prices but by great uncertainty.

Furthermore, this situation is frequently aggravated when governments place ceilings on agricultural product prices. The argument for setting maximum prices for farm products usually is the desire to hold down the cost of living of urban people — industrial workers and government employees.

The result is to reduce the incentives to each farm operator to increase his production just when agricultural development is of prime importance to the nation.

Sometimes farmers increase their production of a crop in response to high prices only to abandon this crop later when they discover that its market price is not dependable.

Farmers in Brazil shifted large acreages to sugarcane, but reverted to growing cereals due to the extreme instability of the price for sugar.

**Influencing farm prices:**

Recognizing that the level and dependability of farm product prices are important to agricultural development is one thing; doing something about them poses complex problems that are not easy to solve.

No programme to affect farm product prices can be effective in the absence of efficient marketing facilities.

If marketing facilities are inadequate or inefficient, steps

should be taken to improve them. If there is monopoly in the market this may need to be regulated, or encouragement may be given to cooperatives or other new marketing firms to provide competition.

Or a government agency may undertake to buy and sell a commodity at reasonable prices, thus providing an alternative marketing channel. To undertake this, however the agency must have access to the physical facilities needed to handle the commodities it buys. Otherwise it will not be able to make good its guarantees, and the result will be worse than if no regulation of prices had been attempted.

Direct regulation of prices for farm products can be of value, but only if wisely and effectively done, and considerable administrative efforts are always involved. It is important to recognize that prices cannot be regulated merely by passing a law.

Complicated programmes of inspection, and usually of government purchase, storage, and sale of those commodities for which prices are regulated are necessary. In view of the complications, it is best to limit price regulation to only those few commodities of which increased production is most needed.

And for these commodities, the first aim should be to increase the certainty of prices, at levels that will be remunerative to efficient producers.

If it is felt necessary to hold down the cost of food to urban consumers, it is better to do this by government subsidy within the food distribution process than it is to choke off the source of supply by setting low product prices for farmers that deter them from adopting measures to increase production.

Farmers will not grow more

just because the nations need greater agricultural production. They will only do this, they can only do this, to the extent that it is profitable for them to do so, and one of the factors affecting this profitability is the level and the dependability of the prices of farm products.

Prices for supplies and equipment. Prices for farm products comprise one-half of "remunerative price relationships", the other half is prices for the inputs a farmer may purchase.

An example of how the relationship between the prices of rice and fertilizer differs among countries is indicated in the following table, see page 18

These figures show that whereas it takes only about one kilogramme of rice to buy one kilogramme of either nitrogenous or phosphatic fertilizer in Pakistan or Japan, in India it requires three to four times as much.

Clearly there is more price incentive for a farmer to use fertilizer in rice production in Pakistan or Japan than there is in India as long as these price relationships hold.

But here again we must remind ourselves that it is the relationship between the cost of inputs and the amount by which they will increase production that is important.

Like the prices of farm products, the prices of inputs are often substantially influenced by governmental policies. On the one hand, governments frequently impose heavy import duties on farm supplies and equipment to stimulate domestic manufacture of them.

Such a policy penalizes farmers from the beginning, and may give rise to domestic industries that can exist only with such protection

for a long time to come.

To stimulate such domestic manufacture is frequently sound policy, but to do in such a way that farmers are discouraged from adopting more productive methods is self-defeating for the economy of the country.

On the other hand, many governments subsidize the cost of certain inputs to farmers in order to stimulate their use. This does stimulate agricultural development, whether or not it is the best policy to pursue depends on a number of considerations that vary from country to country.

To repeat, what is of greatest importance is the relationship between prices of farm products and prices of purchasable inputs. This relationship can be affected by allowing prices of both agricultural products and purchasable inputs to be free of specific controls, subsidies or by placing controls or subsidies on either or on both.

Each of these has its advantages and disadvantages. It is possible to use them in different combinations. What is important is not so much the particular combination of policies chosen as recognizing that the relationship between prices for farm products and for farm inputs is of major importance to the strength of the incentives for farmers to increase production.

The effect of the prices of farm products and of farm inputs on the incentives for farmers to increase production may be summarized as follows:

1. Farmers will increase their production for the market only when they consider the price offered for a particular farm product in the local market to be attractive.

*Continue on page 18*

Continued from p. 18

Country	Quantity of Rice (in kilograms) Required To Purchase One Kilogram of Fertilizer.	
	(1962)	
	Ammonium Sulphate	Super Phosphate (more than 25% P2O5)
Pakistan	0.85	0.89
Japan	1.18	1.00
U. S. A.	1.47	1.02
U.S.A.	3.82	3.19

Calculated from data from FAO Production Yearbook, Vol. 17, 1963

2. Farmers will respond to changes in the relative prices of crops they are already grow-

ing by increasing production of the crop offering the greater value in the market, unless they feel that

this will jeopardize the food supply of the farm family.

3. Farmers will respond to an increase in price of a

particular crop by using improved methods to increase their production of it (1) if the necessary inputs are locally available, (2) if the farmer feels he knows how to use these inputs effectively, and (3) if the price of these inputs is not too high in comparison with the promised value of the product.

4. Improving the efficiency of marketing to reduce the costs of handling, shipping, and processing farm products can increase the local prices received by farmers for their products, or decrease the price to the ultimate consumer, or both.

To be concluded

Continued from p. 6

## HINTS ON BROILERS

from different stocks on such factors as growth, feed conversion, viability, and rate of condemnation should be considered.

In large broiler operations, a common practice is to test several stocks on one farm where suitable facilities are available and careful records are kept.

It is important that the housing, feeding, and management be uniform for all stocks in order to obtain a valid comparison of the factors affecting economic return - rate of growth, pounds of chicken per 100 pounds of feed, mortality, and quality of broilers produced.

The information will provide a more reliable basis for the selection of a stock if the tests are repeated on a second or third farm. The farm or farms selected for the test should follow production practices typical of the area.

In integrated operations, the comparisons may include such factors as egg production, fertility, and hatchability of the parent stock. Other considerations are the cost and availability of the stock and the services provided by the supplier.

### GROWTH AND FEED EFFICIENCY

Growth (final broiler weight) behaves genetically as a simple quantitative character. The demand of the processor for a white bird created a problem for the geneticist, because the dominant white gene seemed to be linked with some growth-depressing factor.

There seems to be no advantage in using any linear measurement over body weight alone. Growth (9-week weight) has been positively correlated with other important economic factors, such as breast width, body depth, and fleshing.

The relationship of egg production to broiler weight at 9 weeks is important. If it is desired to improve egg production in otherwise desirable meat-type breeding stock, it seems advisable to make intense selection for growth rate in stock that is slightly inferior in growth but much superior in egg production.

The more rapidly growing birds are more efficient than the slower growing birds.

It is known that feed efficiency is inherited. There is some question whether it is practical for the commercial broiler breeder to select for it as a specific factor.

It would seem more practical to assume that selection for rapid rate of growth at 4 to 6 weeks of age, and possibly including long shanks, is also selection for high feed efficiency.

Sex-linked genes may be

of considerable importance in the expression of both growth and feed conversion. Since birds selected as early as 4 to 6 weeks do not always grow as expected, a further selection is desirable at about 20 weeks and just before they go to the breeding pens.

### FEATHERING

Processors demand broilers that are uniformly covered with feathers. Because the sex-linked factor for feathering is inherited in such a simple manner, it is highly improbable that any reputable strain does not already contain a large proportion of early-feathering stock.

The method used allowed us to select chicks for fast feathering at a day old and later to select growing chicks for rapid growth and for superior meat production.

Selection is applied to both males and females and

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## BROILERS

to the parental stock producing crossbred broiler chicks.

Selection to obtain breeders that feather rapidly is most easily accomplished at the time of hatching. Fast feathering is a sex-linked recessive to slow feathering; hence, when mated together, male and female breeding birds selected for fast feathering will produce fast-feathering chicks.

Rate of feathering can be determined in day-old chicks by the length of the primary and secondary feather sheaths, of the wing and the number of the secondary feather sheaths. The chick with the highest rate has well-developed primaries and secondaries, with six or more secondaries.

The next best has six or more secondaries, which are not so well developed but are approximately as long as the primaries.

The chick of the slow feathering type has no secondaries, or less than six short ones, and no primaries, or very short ones. Figure 4 illustrates slow-feathering chicks. About 90 percent of such chicks feather slowly, have no tail-feather development at 10 days, and small primary and secondary wing-feather development.

Some of them will develop into "barebacks" at 12 weeks of age, and many of them will have a considerable number of pin-feathers. These are not good breeders with respect to feathering. In this group the males, in particular, should not be used as breeders.

When selection is made of fast-feathering chicks, they should be raised by themselves, or if this is not feasible, they should be iden-

tified by some means.

Wing banding is considered the best and most permanent means of identification. If this is not practicable, then the chicks may be toe-punched, or a pair of scissors may be used to cut the web between the toes. In any case, some means should be adopted so that such chicks can be recognized at a later age.

### BREAST DEVELOPMENT

As the breast meat is the most valued part of the broiler, this characteristic should be given considerable attention in any selection and breeding programme. Observations of breast development should be made when birds are 6 to 12 weeks old.

For these observations each bird should be examined individually and held in a similar position. A good way is to hold the chicken by the legs in the left hand, with its head downward, and with the right hand to examine the width and length of the breast. By comparisons, the birds can be divided into at least four grades.

At this time observations may be made also on any imperfections of the breastbone or skin, such as curred and dented breastbones and breast blisters. Any individual with such imperfections should not be used as a breeder.

With a little experience one soon learns to judge accurately the relative breast development in birds of the same age.

The different breast grades represent measurements used in poultry meat-production experiments at the Agricultural Research Center, Beltsville. This method of classification permits four grades - A, B, C, and D.

If one wishes further divisions, grades A<sup>+</sup>, A, A<sup>-</sup>, B<sup>+</sup>, B<sup>-</sup>, and so on can be

used. Only males with A or B breasts and females with A, B, or C breasts should be kept for breeders.

One of the best times to select breeding birds for efficient, rapid growth is at 6 weeks of age, and it is also an ideal age to observe breast development. As both of these observations may be made at this time, one handling of the birds is eliminated.

### SHANK PIGMENTATION

Shank pigmentation is inherited. Within the yellow-skinned varieties there are distinct differences ranging from bright yellow and orange yellow to green and sometimes bluish shades. This has not been of sufficient value economically to justify much consideration.

Nutrition and freedom from parasites and diseases affect pigmentation much more than inheritance.

### DISEASES (GENERAL)

Chickens differ genetically in their ability to resist invasion by protozoa, bacteria, fungi, viruses, and parasitic worms. It is feasible to develop strains comparatively resistant to *Eimeria tenella* coccidium, fowl typhoid, pullorum disease, visceral lymphomatosis, Newcastle disease, "blue comb," and encephalomalacia. However, it has not been determined whether it is economically feasible to do so in any case.

When severely exposed to respiratory disease, the strain cross progeny of good non-inbred strains fared better than their pure parent strains.

The S6 strain of avian pleuropneumonia-like organisms (PPLO) *Mycoplasma gallisepticum*, an agent, or one of the agents, in the air-sac disease complex or airsacculitis, is present in most broiler breeders.

The ultimate objective is

to eliminate the infectious agent from breeder flocks. A blood test can be used to detect noninfected flocks. It has no value in detecting individual birds, as in the pullorum test.

Dipping eggs in antibiotic solution can help in reducing PPLO in breeders, but is of questionable value in the routine treatment of eggs for broiler production.

As airsacculitis is the largest single cause of condemnations, the elimination of PPLO from breeders is very important. Foundation breeders should assume the responsibility for cleaning up all their breeder flocks.

Both male and female lines must be clean. In order to facilitate the development of "clean" flocks, breeders may, with insignificant genetic loss, relax selection for 8- or 9-week body weight for one generation.

Both broiler breeder replacement and broiler chicks should be from parent stock free of PPLO. Therefore, in commercial production of replacement stock, reasonable geographic isolation of serologically tested negative birds is important. Special precautions should be taken to see that management isolation is not disrupted at any time.

### LEUKOSIS

The amount of leukosis in broiler condemnations and total mortality are often masked by conditions such as septicemia and airsacculitis. There is no practical test by which the infected hen, egg, or chick can be detected. A hatchery should not accept eggs from a breeder flock with a high incidence of leukosis.

*The ability of certain strains of birds to resist the virus that causes visceral lymphomatosis, the most prevalent form of*

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## "THE PILL"

Again, this is not typical in Britain, where one ram to 40 or 50 ewes is generally felt to be sufficient.

Where it is not economi-

cally possible to have more rams, and they cannot be borrowed or hired, artificial insemination (a.i.) may become more popular. This is particularly likely where a breeder wants to make use of top quality rams to make a rapid improvement in his whole flock.

Continued on page 19

## BROILERS

*leukosis, has been shown to be due to genetic factors. Culling of flock is most effective if done on a family basis, and entire families with individuals showing indications of the leukosis complex, such as irregular pupils, marble bone, or other symptoms, should be eliminated.*

A highly susceptible strain should not be used for crossing purposes. Since the disease can also be transmitted by direct contact between chickens in the same hatching or rearing units, isolation procedures are essential. There is no known treatment for leukosis.

### NUTRIENTS

The requirement for certain amino acids—arginine, methionine, but not lysine—is inherited. Genetic differences have also been exhibited for the A, B<sub>1</sub>, D<sub>3</sub>, E, and riboflavin vitamin factors, the unidentified growth factors, manganese, calcium, and zinc.

Again, selection for rapid growth normally emphasizes the individuals most capable of efficiently using these nutrients and leads to the elimination of those having an abnormally high requirement for them.

Basically any individual with an abnormal requirement for any nutrient should be eliminated as a breeder.

### PLUMAGE COLOUR

Growth rate and other characteristics may be affected

by the genes that determine plumage colour of broilers. For example, the gene for silver apparently has to be associated with the gene that extends black and with recessive white for maximum growth.

If white birds are desired, the dominant white gene needs to be combined with the gene causing barring.

Colour sex-linkage for determining sex at hatching has not made progress because the females are not white. Processors want all bird to be white.

### EGG SIZE

Broiler chicks from large eggs (24 to 28 ounces per dozen) are definitely larger at hatching than those from small eggs (18 to 22 ounces). As broilers grow, the effect of this relationship is less, but it is still definite at 8 and 12 weeks for body weight and possibly for feed conversion.

The trend in early chick mortality is high in 18 to 1 ounce eggs.

When hatching eggs are scarce and more small eggs are set, broiler raisers observe that mortality tends to increase and growth and feed conversion suffer. In independent operations, broilers from larger eggs usually bring a greater cash return per bird over feed costs. However, in an integrated operation, broilers from smaller eggs may give greater total returns over egg and feed costs.

It has always been the most obvious advantage of A. I. that it enables a small number of top quality male animals to be used on an exceptionally large number of females, with often startling results. More meat, milk or wool can be obtained in a reasonably short time by herd or flock improvement through A. I.

### Pressure on output

Control over the female's breeding cycle makes A. I. even accurate and effective, and it should lead to increased use of both techniques as world-wide pressure grows to increase farm output and productivity.

The same pressure is forcing livestock production in many countries to become more intensive, with vast numbers of animals being housed and fed on fewer and fewer acres (hectares).

In these big beeflots and milk "factories", or in the large pig production units, controlled breeding could enable farmers to utilise their labour, machinery and buildings even more effectively. Synchronisation of cattle mating (either natural mating or through A. I.) and calving, could be timed to achieve maximum output of milk or beef at the period when market prices are the most attractive.

At present there are no "birth pills" or other control devices for cattle on the market in Britain although several of the major pharmaceutical firms are working on the project.

### No Problem With Pigs:

In pigs there is not the same need for artificial control of breeding in a dult sows, as oestrus can be regulated very successfully by weaning groups of sows on the same day. About 80 per cent will exhibit oestrus

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# NEWS

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## TRACTOR HIRING

### OPERATIONS GO UP TWOFOLD

TOTAL OF 9,120 ACRES WAS CULTIVATED IN THE UPLAND AND FADAMA AGRICULTURAL OPERATIONS IN THE NORTH WESTERN STATE THIS YEAR. THIS SHOWED AN INCREASE OF OVER THE INCREASE CULTIVATED IN THE OPERATION LAST YEAR.

A release from the States Ministry of Natural Resources here gave the provincial totals of cultivated acres as 4,920 and 6,200 for the Niger and Sokoto Provinces respectively.

The release further stated that the acreage cultivated this year is expected to be doubled in the coming season.

The Tractor Hiring Unit operations of the Ministry of Natural Resources, continued the statement had, this year increased by 100% over that of last year.

This, the release added, was due to "intensive extensive campaigns by the Agricultural Extension Staff" and also "the grant made to the State by the Federal Government for Agricultural production Scheme".

Another report from the same Ministry said that 24 students have passed out from the Talata Mafara Farm Training Centre as Agricultural Instructors.

These the report added, would bring the number of Agricultural Instructors produced by the Centre to 240.



## A NEW CULTIVATOR

First public demonstration by a British manufacturer of the new Salix Spring Tine Cultivator—an attachment designed to speed arable work on the farm. Among its built-in benefits are: four-bar-high carbon steel frame for strength and high speed working conditions; frame bars spot marked for easy time positioning when necessary shot peened tines fitted with reversible points, precisely tempered for wirbrant action and made from the finest steel available; and screw top adjustable depth control wheels with pneumatic tyres.

The attachment is available in a wide choice of widths—from 9ft. 6in. to 25ft. 9in.—and can be used with tractors from 40 hp to 110 hp.

Manufacturer: Richard T. Evans, Eynton, near Leamington, Herefordshire, England.

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## FEBRUARY '71

features will include

1. Farmers need INCENTIVES (2)
2. What is C. R. D. in Poultry ?
3. At the Cocoa Research Institute, Ibadan & lots more

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## HORTICULTURE

ready for market at the same time. Customers want soft leafy stuff. Eaten, they do not live any strings in the mouth - a proof of derness.

Every State's Ministry of Agriculture has a Demonstration Centre where would-be horticulturists receive guide. The officials will be happy to help you solve your questions.

Try horticulture and start hearing the jingle of coins in your pocket always.

Next time, we shall talk about preparing the ground.



This 23 in (584.2mm) rotary grasscutter is recently introduced by a British firm. Powered by a 5 hp. four stroke engine, the machine is designed to fill a gap between the smaller domestic grasscutter and the large professional model.

Controls are placed conveniently on the handles which can be adjusted to the height of the user.

Manufacturer: Wolsley Engineering Ltd.,  
Electric Avenue, Wilton Birmingham  
6, England.

Continued from page 20

## "THE PILL"

within four days.

In gilts there has been difficulty in spotting the correct time for a.i. but this problem has been overcome by a compound given in the gilt's feed to control oestrus.

The makers have also produced a similar compound which, when given to poultry, stimulates the birds to moult by controlling ovulation.

Manufacturers referred to:  
**Ovarid pill for dogs - Glaxo Laboratories Ltd., Greenford, Middlesex.**

**Syncro-Mate for sheep - G. D. Searle and Company Ltd., Lane End Road, High Wycombe, Buckinghamshire**

**Pig and poultry compounds - Imperial Chemical Industries Ltd., Millbank, London, S. W. 1.**

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# FARMSTOCK

## FARMERS' MONTHLY

● Vol. 1. No. 53

FEBRUARY 1974

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### LAGOS STATE AGRIC SHOW, FEB 7-9.

Oba Adeyinka Oyekan II of Lagos strolls through the NIFOR STAND.

See pp. 4, 5, Centre & Back

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# **FARMSTOCK** Monthly Magazine on agriculture

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Managing Editor: **Abiodun Ojugbele**  
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## **AGRICULTURAL SHOWS AND FARMERS' FESTIVALS**

**If there are standards at all in doing anything such should be maintained and continuously improved upon. Keeping up with any standard is no joke and much more so in terms of improving on an old one.**

**The last Lagos State Agricultural Show and Farmers' Festival has come and gone much to the relief of the organisers who must have spent hectic hours planning, discussing and executing plans for the momentous occasion. What has the whole exercise left in our minds?**

**Without doubt it is a yearning for a better one.**

**And what is the purpose of an Agricultural Show and / or Festival? These facts are clearly listed out by the Oba of Lagos, Adeyinka Oyekan II in his opening speech. Rightly, the Oba disclosed that a show cum festival is a period of rethinking, comparison and exchange of ideas.**

**Farmers are drawn from a surrounding area to acquaint them with the latest in equipment, new breeding and planting techniques and other relative matters. Since the Show will be dull without some fun hence the dances and displays.**

**Unfortunately, the latter have taken up the essence of the whole affair. Usually, after the brief inspection of the stalls by the Chairman of the day, everyone else flocks to the foreground of the visitors' shed to watch the displays, leaving the exhibits and exhibitors to themselves. Some of the stall staff are therefore not to blame for leaving their places to peep at the dancers.**

**The Shows, usually lasting about 2 hours at most, often end the day (i.e. around 1 p.m. local time) even though the stalls are expected to be open till dusk for workers, clerks, technicians and others unable to attend the morning session, to have a glimpse. It is only in this way that young minds and vacillating would-be farmers can be attracted.**

**A Show of the standard envisaged for annual event should consider educational platforms, giving talks at intervals to would-be pursuants of particular ventures. Pamphlets informing visitors where and when talks are taking place should be profuse and obtainable for the asking.**

**Statistics is totally neglected. How many attended when and from where along with a total break-down of the whole crowd is a day dream from any questioner whereas such figures will help the organisers to know if the event is holding its own or losing grounds and why.**

Furthermore, it will help to ginger up areas where response has been poor.

What is equally annoying about the last Lagos State Show was the abruptness of the whole affair which to many came like a whirlwind giving no one time to sort out things along its path. While good publicity had not been given to the whole affair, the Day Two events were also tumbled over one another.

The Press which should have been given a booth at vantage point was almost unseen but for the occasional flashes from the cameramen.

Even with all these lapses the occasion, for being marked at all, has carved a niche for itself in the minds of people as an event they have to look forward to.

It is our hope that future Shows and Festivals will be better arranged in all ways catering unexcepted bearing in mind the site.

A big 'thank you' goes from this medium to all those who in one way or another worked to bring about the Show. In years ahead we hope, most of the pioneer workers and organisers can look back proudly for being ever connected with the event.

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COVER PICTURE :

## Lagos State holds third Agric Show and Farmers' Festival

The Lagos State held its third Agricultural show and Farmers' Festival in Ikeja for three days running from February 7-9 this month. Oba Adeyinka Oyekan II of Lagos was the Chief Guest of Honour for the Day Two of the Festival. The Oba spent some time inspecting the produce, livestock and machinery. The Oba was keenly interested in the whole show as he talked cheerfully with the exhibitors all over the ground. In the front cover picture, the Oba accompanied by other Obas, Chiefs, Commissioners, eminent personalities including the Military boss of the Lagos City Council Col. K. Sho - Silva (back to camera at extreme left) was conducted round the show by Mr. S. O. Oke (in suit near Oba) the Chief Agricultural Extension Service Officer of Lagos State and Chairman of the Central Working Committee, Organisers of the Show and Festival.

*By Courtesy of APN, Nigeria*

# Africa's Agriculture, by G. ABRAMOV Soviet

Two research studies by Soviet economists have recently been published in Moscow. It is Ivan Svanidze's "Tropical Africa's Agriculture" (Mysl Publishing House) and "Problems of Agricultural Planning and Development in African Countries" by Nikolai Gavrilov (Nauka Publishing House).

The very fact of practically simultaneous publication of these two extensive monographs in Russian testifies to intensive agrarian research being carried on by the Soviet students of Africa.

Their active interest for the countryside problems is quite legitimate. The backwardness of Africa's agriculture employing four-fifths of the continent's population is mostly keeping in check the processes of economic growth of Africa's countries. Analysis of the prospects for converting Africa's

agriculture from the traditionally extensive into up-to-date intensive farming is the major task of science.

Speaking of the contents of the book by Soviet authors, one cannot help mentioning their profundity, seriousness, the complex and comprehensive character of research. The two works are no repetition of one another, but rather wonderfully add up to each other both in the choice of subject matter and in the approach to problems.

Indeed, while I. Svanidze tackles the agrarian sphere "from within", N. Gavrilov approaches it as a subordinate element, "inscribed" into a wider system. This kind of approach "from without" is quite justified, because the dynamic development of the African countryside is increasingly determined by the processes taking place outside its limits.

As emphasized by the Soviet authors, the main responsibility for the backwardness for Africa's countryside rests with colonialism. "Economic activities of colonialism in Africa" writes I. Svanidze, "capitalized on this backwardness and this situation was quite to the satisfaction of the white owners of "black continents".

What is more, colonialism was deliberately retarding the development of Tropical Africa and was conserving backwardness to facilitate and prolong here its political domination. Africa's backwardness contributed to normal functioning of the colonialist system - here lies the "secret" of the policy pursued by the colonialists.

Africa's peoples which have won their independence from colonialism face the task of undertaking a triple



# as seen by Scientists

reconstruction of their agricultures: technical-economic, economic and social-political. What are the available prerequisites for such a reconstruction, what are the productive forces of modern Africa, I. Svanidze attempts to give answers to the questions by giving a detailed description of natural conditions, agrotechnics, farming crops, animal husbandry, technical basis of agriculture and its economic structure.

A special chapter deals with the African peasant's social psychology. It would be no exaggeration to say that I. Svanidze's book has a truly encyclopaedic character. At the same time, the author focuses attention on key points and debatable issues exposing the colonialist-fabricated myths.

According to one of such myths, modern agricultural techniques are allegedly inapplicable in Africa because of its natural, particularly soil-climatic conditions, and because of the peasantry's backwardness.

These assertions, as proved by the Soviet author served as a camouflage for the colonialists unwilling to take any realistic steps for the modernization of traditional farming.

In reality there were some failures when attempts were made for mechanical transfer of European farming methods into African conditions. Modernization machines, implements and methods of their utilization.

Mechanizations, I. Svanidze maintains, "as a development stage is not to be avoided in Africa's agricultural progress".

An analysis of the experience of farming mechanization in a number of countries has brought the author to a conclusion that this process is not to be conceived separately from a transformation of farming practices, from a reconstruction of the entire economic and social pattern.

Optimal conditions for a wide,

complex mechanization of agricultural production lie in the unification of the farmers into a system of production cooperatives and in the growth of the network of state-owned farms and plantations.

Social factors are having a tremendous effect on the status, development rates and structure of agricultural production in Africa's countries.

As noted by the Soviet authors, today even the bourgeois researchers recognize the need or a transformation of the African village's traditional institutions which are restraining the producers' initiative and energy.

But in what manner at whose expense this kind of transformation is to be carried into effect? The bourgeois ideologists see the way out in the

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# Africa's Agriculture

"individualization" of the produces. i.e. in promoting private in place of former communal farming.

However, the historic experience of other regions indicates that private land ownership accounts for irreconcilable class contradictions in the society, giving birth to a section of rural bourgeoisie, on the one hand, and a mass of landless proletariat, on the other. The capitalist way destined the overwhelming majority of peasants for interminable poverty, oppression and illiteracy.

Moreover, at the present development stage of Africa's productive forces the small — and even average-holder farming, N. Gavrilov writes, "will be unable considerably to raise the farming output and adequately to improve its quality".

In I. Svanidze's opinion, neither communal nor private farming can secure the overcoming of peasantry's conservatism in economic questions: this can only be done by a system of farming composed of state-owned establishments and production cooperatives.

Under the conditions of big public production the African concept of collective land property will obtain a further development, casting off at the same time its patriarchal

tribal and religious-mystic cover. Tribal mutual assistance will be superceded by the mutual assistance of all workers in production.

As evidenced by the experience of the Soviet Union and other socialist countries, involvement of the peasantry for a drive towards collectivisation does not come by itself, without a leadership provided by the vanguard party, without the state's assistance.

It is the state that must step in to organize a cooperative movement and find transitional forms of co-operation, that would be intelligible and accessible to the farmer. The state poses also as the employer where state farms come into questions. It wins command over such levers of influence on the village as taxation, credits, state purchases, etc.

An increasing economic role of the state in African countries is not to be achieved without planning. Therefore, an attempt by Soviet economist N. Gavrilov to offer a generalization of the agricultural

planning experience in Africa's independent countries appears to be quite urgent.

But the author's analysis by no means confined to problems of methodology and technique of planning. The study of the problems in question has enable him to make some important general inferences on the development trends in the African countryside which is now in the period of transition.

The Soviet researcher expresses confidence that "the Africans will be able to see in due time from their own experience that only the public ownership of basic means and implements of production paves the way to the setting up of a genuinely scientific system of planning and ushers in the possibility of rational development (from the viewpoint of the entire society's interests) of agriculture".

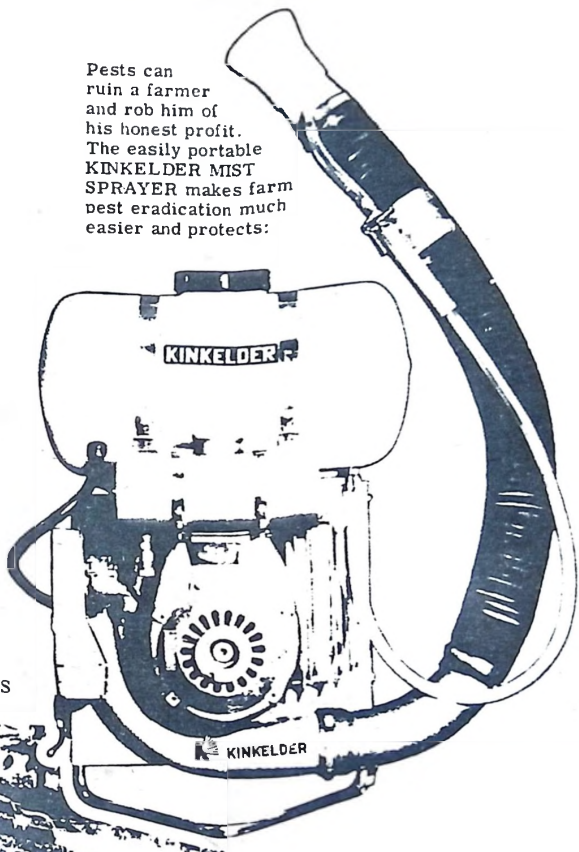




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MAN HAS CONTROLLED BIRD,

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**N**owadays crops are cultivated with ever-increasing skill to improve the final yield harvest of grain, fruit, root or leaf.

All plants, including those we use for crops, require water, nutrients and sunlight to grow. Their yield can be increased, therefore, by the application of irrigation water and fertiliser where these are naturally in short supply.

We are becoming so good at this that it is now possible to forecast accurately the ultimate yield from the amount of these

inputs applied, assuming a number of other factors—which we generally include under the heading of “weather” - can be relied on.

One ingredient of “weather” is sunlight.

Now agricultural scientists are beginning to ask if yields can be increased even more by controlling the way in which crops collect and use sunlight. A group in Britain concerned with tropical crops thinks we can and is working to find out how.

#### Light Measurement

One of the group, Dr. Jeremy Elston, lecturer in Agricultural Botany at

Reading University, southern England, explained the thinking to me.

The yield of a crop, be it cereal, legume, root or fruit, depends principally on the formation of starch within the plant. This starch, a carbohydrate, is synthesised from the elements of carbon hydrogen and oxygen taken from carbon dioxide in the air and from water in the soil.

Synthesis takes place within the leaf and is brought about by the sunlight that falls on it. The rate of photosynthesis (as this is called) and hence the formation of crop starch

is proportional to amount of light collected the plant through the surface.

If light received by plant is measured, this can be used to predict yield remembering to take account water and fertiliser as well, of course. But it is more exciting, if it is possible to change the amount of light collected by a plant, then the yield could be controlled.

Here is the germ of an idea that has inspired a group.

#### Already Achieved

Prediction of crop



ANIMAL BREEDING, NOW

# British Want to crops

by KEN BEAN

editor: "World Crops," London

date formed in a plant by measurement of the light

has already been achieved using experimental work done by Professor John Montieith, an environmental physicist at Nottingham University in the English midlands. His experiments have enabled him to calculate the rate of photosynthesis of carbohydrate from light received in various crop plants.

By building up a set of "models", or typical situation for the variables of light intensity and total leaf

area, he and his colleagues have been able to make predictions accounting for 80%-90% of the carbohydrate formed in plants such as maize.

It is a short step from there to translating the figures for carbohydrate into crop yield.

Britain's Overseas Development Administration has made a grant of £30,000 towards further research, aimed at determining why actual growth and yield often fall short of maximum known figures. In other words, why are

all our harvests not recorded?

## Timeliness Of Planting

Until now we have explained this away by pointing to variations in water, soil nutrients or weather - including sunlight. It might be due to the availability of sunshine to a far greater extent than we have previously thought. If this is so, timeliness of planting so as to make the best use of the sun may become as much part of our calculations as the quantity of fertiliser or the irrigation we apply.

The scientists who will do this work are Professor Montieith, Professor A. H. Bunting, tropical agriculturalist at Reading University, Dr. J. R. Milford, senior lecturer in meteorology at Reading, Mr. M. D. Dannel, a Research Fellow of Reading University and Dr. Elston.

They will work in conjunction with the International Institute of Tropical Agriculture at Ibadan, Nigeria, where

Continue on page 12

# Crop Control

much of the practical fieldwork will be carried out. Principal crops the group expects to study will be rice, maize, cow peas, soya beans and groundnuts.

Ibadan is particularly useful for carrying out practical tests because it is close to the equator and in consequence has a constantly high temperature but relatively little direct

sunlight, due to cloud cover typical of the tropics.

### Prediction And Comparison

At Reading and Nottingham and at Ibadan the group of scientists will be doing three things: trying to predict rates of growth and yield from light measurement and leaf area, measuring actual rates of growth and comparing the two results and accounting for the difference as far as possible.

Explaining the significance of the work as it would help the tropical farmer, Dr. Elston said: "Supposing we found that maize produced a better yield if it had a lot of leaves in its early stages but less later on - in fact, less than the plant normally carries. If we know the exact timing, we could improve yield by stripping the leaves at the right time.

"This could be done by using, perhaps, a chemical defoliant or even by hand stripping".

Dr. Elston stressed that this was only hypothetical - as yet there is no evidence that stripping leaves might help yield. It may be that more leaves would improve yield or even if the leaves grew at a different angle, as has been found with the

*“Meanwhile we can look forward to the time when as a result of their work we can predict and perhaps control our harvests to an even greater extent than we can today.”*

new hybrid short-stemmed rices.

### Plant Breeding

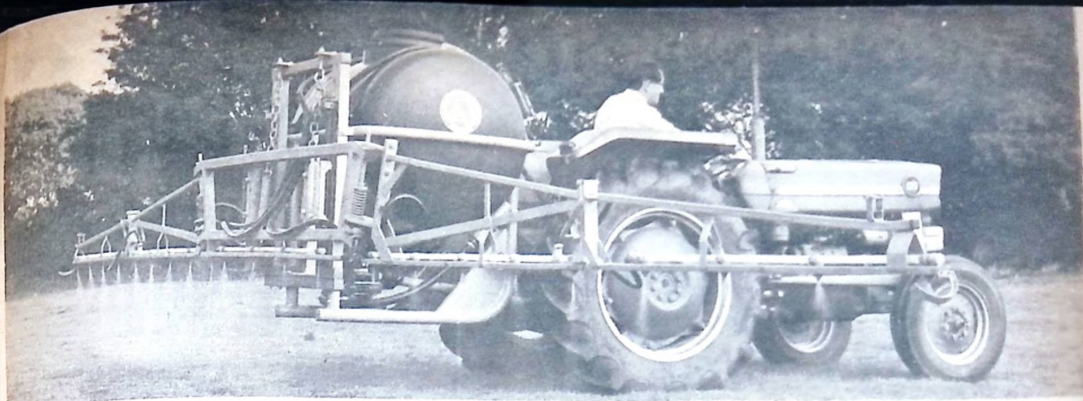
This is where the plant breeder comes in," said Dr. Elston. "Just as he has been able to breed for improved yield under better conditions of irrigation and fertiliser application, might he not be able to breed for the best yield according to the known amount of sunlight in the region in which the crop is to be grown?"

One thing is certain: other scientists and agronomists helping farmers have experiences where

variations in growth during controlled experiments have been affected by what can only be attributed to sunlight - or lack of it. The British group is inviting other scientists who have any information which may be relevant to contact them through Dr. J. Elston at the Department of Agricultural Botany, Plant Science Laboratory, 'Whiteknights', Reading RG6 2AS, England.

Meanwhile we can look forward to the time when as a result of their work we can predict and perhaps control our harvests to an even greater extent than we can today.

## TRACTOR— MOUNTED SPRAYER



*A new high-capacity tractor-mounted sprayer was displayed by a British firm at the Royal Smithfield show held at London's Earl's Court recently. Called the Allman Model 150, it has a tank capacity of 680 litres (150 gallons) and an application rate of up to 720 litres per hectare (or 60 gallons per acre). A wide boom of 12 metres (39ft approx) is available in place of the standard 10 metre (33ft approx) boom - both have boom flotation giving more even spraying and greater driver comfort. The new sprayer can be used for applying liquid fertilisers by using stainless steel nozzles, and is equipped with a self-filler, anti-drip check valves in each nozzle and synchromatic control.*

E. Allman & Co. Ltd., Birdham Road, Chichester, Sussex, England.

# The Case For Machines On The Farm

— Farming Correspondent

**N**o one denies that machinery has been a tremendous agricultural labour saver. But unfortunately it has received practically no credit as a direct contributor to increased yields.

This oversight is unfortunate, because when alternative ways are considered for increasing crop yields in the developing countries, the case for investing in machinery is often given too low a priority.

Because machinery is believed to be primarily a labour saver, many legislators and development planners believe machinery should be used only when labour shortage develop. They thus would deny a country the advantages machinery brings even while there is a labour surplus.

### INCREASE YIELDS

How can machinery increase yields?

First, it can often do a better job than hand labour. Only a machine can plough deep enough to take advantage of a soil's full fertility. Only a machine can place seeds in exactly the desired spacing and depth and only a machine can spray herbicides and pesticides uniformly.

Second, a machine by doing a job faster, can take advantage of weather opportunities more quickly than hand labour. This is particularly true for seedbed preparation, but also for cultivating and harvesting. Indeed, with machines it may be possible to multiply crops when that was not possible before.

Third, as machines replace animals for farm labour, land formerly used for feed crops can be released to higher-yielding food crops.

Were machines and animals even just equal in efficiency this would be a strong argument to use machines.

### RELATIVE PROBLEMS

Advocates of increasing use of powered machinery in developing countries must responsibly face numerous problems however. The machines used will often need to be much smaller than are commonly used in say America.

It is better to try to adopt the machine to the social and economic situation than to try to change the situation to fit the machines. Machines will have to be designed and

manufactured with the needs and problems of the developing countries in mind - they must be made simple and rugged.

But most important, if machinery is to be effectively used, agric-machine centres must be established within the range of the farmers who are to purchase the machines. These centres, which would distribute other agricultural inputs as well, would be responsible for educating farmers in the use and care of their machines in addition to being responsible for repairs.

Finally, credit may have to be provided for machinery purchase, although that could be a function of a governmental institution.

# LAGOS

The third Lagos State and Farmers' Festival in Ikeja. The three days — February 7-9 — were largely attended by dignitaries made up of Obas, Chiefs, and Ministers.

The Chairman of the Lagos State Government, Mr. Oluwole Osofisan, was the Chief Guest at the opening ceremony on 8th February, 1974. The Governor — Brigadier General A. A. Adenuga — was unavoidably absent. Another important official, the State's Commissioner of Agriculture, was also absent.

The Oba's opening speech was punctuated with applause and praised the effort of the State's farmers in their bid to feed the State and the nation. That life co-operation is the theme of the Oba's speech. The sector of the State which has been left out in the development schemes of the Government is agriculture. He promised amidst cheers from all sections of the crowd.

**AIMS**  
The aim of the Agriculture and Farmers' Festival was to create an atmosphere for the display and exchange of modern techniques, tools and equipment and the exchange of new ideas. The occasion, with various prizes and certificates being awarded, offers a great challenge to every farmer in a healthy rivalry to produce his best.



## OLUWERI

From Epe comes the OLUWERI group of traditional dancers. As they danced, they appealed to the god of rain to shower plentifully during the next planting season. Above the leader of the group raised a tune as her members (picture top right) danced. The lower picture depicts a stage in the dance.

Mrs Elsie Femi Pearce and Chief T. O. S. Benson shared smoked fish in the FISHERIES Booth at the Show in picture right.

# THIRD AGRIC

# STATE HOLDS

gricultural Show  
 Festival which lasted  
 7 to 9, was  
 eminent persona-  
 Commissioners,  
 and permanent secre-

of the Festival on  
 as Oba Adeyinka Oyekan II  
 the State Military  
 Johnson - billed  
 State Governor was  
 occasion due to  
 where in the country  
 Agriculture disclosed.

ake farming an envi-  
 and respectable  
 nation", the Oba added.



The State Commissioner of Agriculture Mr. J. O. Johnson-Agiri, above, disclosing the unavoidable absence of the State Governor - Brigadier Johnson

Before the Chief Guest of honour and Chairman of the occasion Oba Oyekan went round the exhibition, the students of Ideal Girls School, Yaba, holding crude farm tools - hoes, cutlasses and machets - rendered a Yoruba song confirming the importance of farming in the state's culture. Education without farming is a farce, they continuously sang to the thrilled crowd.



The Chairman of the last day of the Festival was the Federal Commissioner for Agriculture - Dr. J. O. J. Okezie. He also praised the effort of farmers and promised the assistance of the Federal Military Government whenever needed. He was later conducted round the stalls as he spoke cheerfully to the exhibitors. Dances, shows and merriment rounded off the festival.



**WONDER!!!**

From Badagry came pole dancers (above) who thrilled the visitors.

Continue on page 16

Oba Adeyinka Oyekan accompanied by important personalities went round the booths and stalls. Above Mr. S. O. Oke, the Chief Agricultural Extension Services Officer, Lagos State explains a point of interest to the Oba closely followed by the State Commissioner of Agriculture - Mr. J. A. Johnson-Agiri, the Chairman of the Lagos City Council Col Kehinde Sho-Silva and a Lagos White-cap Chief.

# SHOW

## COMPARATIVELY

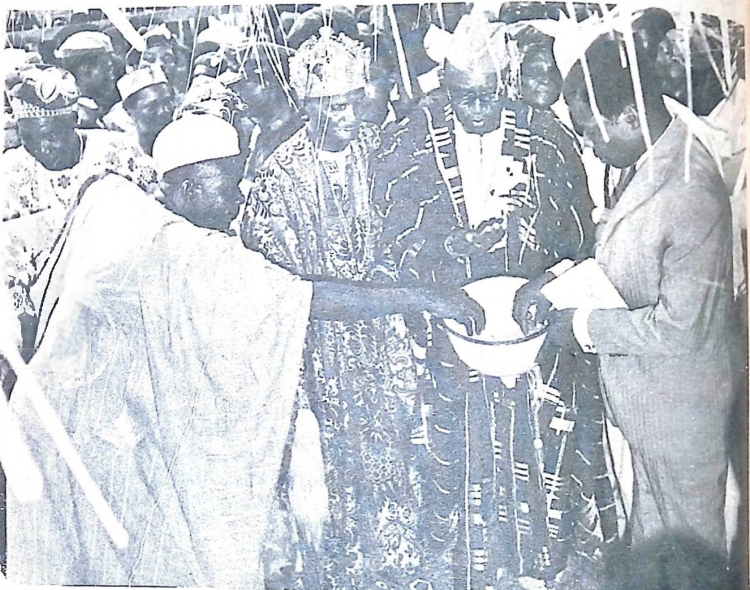
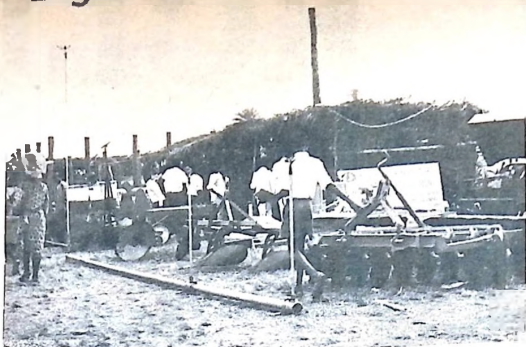
Compared with the previous occasions, the show was poorly attended and exhibits were scanty. Rather than becoming a lively and eagerly awaited annual event, most farmers complained of being taken unawares. As a result, many did not participate.

It seemed the Festival was losing its early momentum and unless a serious programme was drawn out involving the farmers properly, the whole exercise might soon collapse; haphazard effort never succeeded.

The crowd, mostly of aloof and sight-seeing illiterate market women herded about by group leaders were quite disinterested in all around them. Numerically thinner than previous ones, the crowd, about a third of last year's and a fifth of that of three years ago, lacked eminent farmers and young aspiring educated farmers who should have formed the core of the visitors.

No, they were not around at all. Rather, the same old faces of a few disillusioned politicians and blank school children asking strange questions could be seen. A few displaced businessmen came to look for 'business' they could make, definitely in a wrong place. Catering was poor in all aspects - food, drinks and service. Most farmers from far and near went away in hunger.

Nevertheless, FARMSTOCK congratulates the brains behind the whole affair, and wishes everyone to strive harder in making succeeding ones lively.



with Agriculture...  
in the Show. Among...  
were DIZENGOFF...  
displayed a good...  
farming equipment as...  
in the picture (left)...  
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pied by Oke-Afa...  
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and timber by the Niger...  
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They satisfied question...  
and distributed leaflets...  
their products. Other firms...  
the Show were OLAGUN...  
BEWAC and AGROTEC...  
a division of OKF AF...  
FARMS LTD

Above. Oba Oyekan...  
amidst other Obas and...  
Chiefs examined some grains...  
from a bowl held by Mr. S...  
O. Oke, the Chief Agric...  
tural Extension Service...  
Officer, Lagos State. LEFT...  
The Federal Commissioner...  
of Agriculture - Dr. J. O...  
Okezie and Mrs Okezie...  
the Chief guests for Da...  
Three (Sat. Feb 9) of the...  
Show. In Picture (left)...  
Federal Agric. Commission...  
handed a prize to Mr. A. K...  
Ohukotun while the State...  
Commissioner of Agriculture...  
- Mr. J. O. Johnson - Ag...  
(in suit) cheerfully witness...  
the occasion.

# Towards Guaranteed Harvests

Three million hectares of irrigated land are to be put into use in the Soviet Union in the current five-year plan period (1971-75). With this in view, new irrigation systems are under

construction and the existent ones are being expanded.

A 112-km trunk canal that had been built in the fifties in the Don steppes in the south of the European USSR is

under reconstruction. Its capacity will increase by 50 per cent. The line will increase to 60-70 metres in width and up to 6 metres in depth. It will be transformed into a veritable steppe river letting through at its head 250 cu.m of water per second.



The bridges and viaducts on this course are being widened, and other units built. Automation and telemechanics are being introduced on a broad scale.

New extensive areas of guaranteed farming are being created in the canal zone. Rice, maize, vegetables, grapes and other fruits will be grown there; cattle husbandry boosted.

Large state farms are located in the zone of the trunk canal in the Don area. Sprayers as in picture, left, are widely used there for watering the fields.

The development of a major sugar producing area, citrus growing and rice fields all owe their success to the irrigation scheme. Just as important is the industrial growth that followed.

Before irrigation there was not enough produce to justify a railway. Now the line is busy, contributing too to the development of the Swaziland iron ore industry.

The mills of the Mhlume (Swaziland) Sugar Company, a wholly-owned CDC Subsidiary, process one half of the country's entire sugar quota. In a good year Swaziland is one of the biggest rice producers in southern Africa and is rapidly becoming a big grower of citrus, mostly grapefruit.

Fruit which does not meet market standards goes to the local canning factory - in which CDC also has a big investment.

Land not worth irrigating is used for cattle, and the herd's quality has improved. Six thousand heads of cattle

were included in the CDC's original purchase. But although the ranching of beef cattle is subordinate to the chief effort, during the past 15 years an important infrastructure has been established on which non-intensive systems of fodder production and animal feeding can be explored.

## Farms Scheme

Another by-product of the scheme has been the introduction of a project to settle Swazi farm workers on irrigated smallholdings through Vuvulane Irrigated Farms, a directly managed CDC organisation started in 1962.

Under this scheme, smallholders lease land and hire machinery. Vuvulane offers 30 new settlements a year on farms of 16 or eight acres (6.4 to 3.2 ha). Even before they start work, the CDC farmers know that the problems they once faced, of drought and uncertainty in the marketing of crops, have been removed by irrigation and the provision of a ready market through CDC outlets.

So sought after are the smallholdings that there are more than 300 applicants each year from all over the country.

Most of this scheme is concentrated on the growing of sugar, which is sold to Mhlume (Swaziland) Sugar Company, but a quarter of the land is planted with cotton, maize and other vegetables.

The intensification of commercial farming under irrigation and the setting up of the sugar mill have attracted labour from neighbouring villages. An estimated 15,000 Swazis, including dependents, are supported by the opportunities created by the scheme.

When he works for a CDC farm, the labourer is provided with housing and food and his employer is expected also to undertake other civic and social obligations.

Schools have been built; there are three clinics, with full time staff; recreational facilities, literacy classes

and churches also fall on the employer's budget.

## Insight

The CDC also operates the Managa Agriculture management Centre, for training potential agriculture project managers.

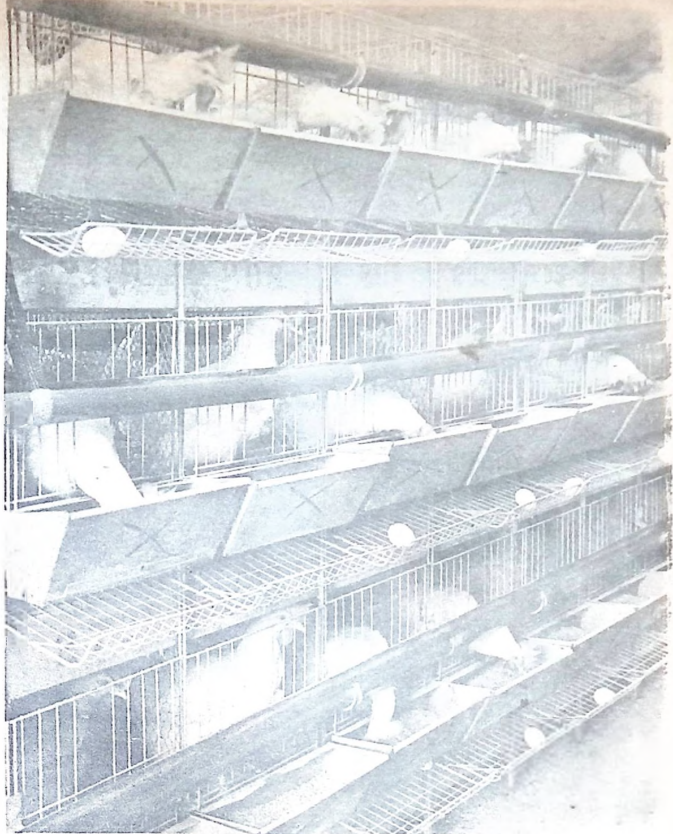
The irrigation engineer, Mr. Hugh Dawson, formerly project general manager in Swaziland, and an executive of the corporation, said: "The Swaziland Irrigation scheme has captured the interest of people inside and outside the CDC and the agriculture training centre is a good plan, giving people an insight into agricultural management".

The scheme is a continuing process which is not subject to a set programme of years to run before it is complete. What is the plan for the future?

Mr. Dawson said: "The thing is to train the local people to take the place of expatriates so that eventually it becomes a Swazi-run operation and Swazi-owned too."



# Which Layout for Battery Cages?



by Our Farming Correspondent

**T**here are three principal ways of building a battery cage for layers, each of which, however can be made in many individual varieties. Three principal forms are,

- (1) Stepped Cages
- (2) Tiered Cages
- (3) Flat Deck Cages

What are the particular advantages of each of the three types, and how should the farmer choose between them? Is there one type which is best for all conditions?

Does the best type depend on the conditions, or can the farmer choose any of

the three types according to his personal preference and get equally good results? To find the answers let us consider each type separately and see what are the advantages and disadvantages.

The Stepped Cage is the commonest type in Nigeria and in other hot countries. It is built in either two or three stepped rows of cages, the two

step kind being the more popular since it is easier to look after.

Its advantages are:

- (1) The construction is simple and cheap.
- (2) There is no need for any mechanisation unless the farmer wants it.
- (3) There is a good natural flow of air through the

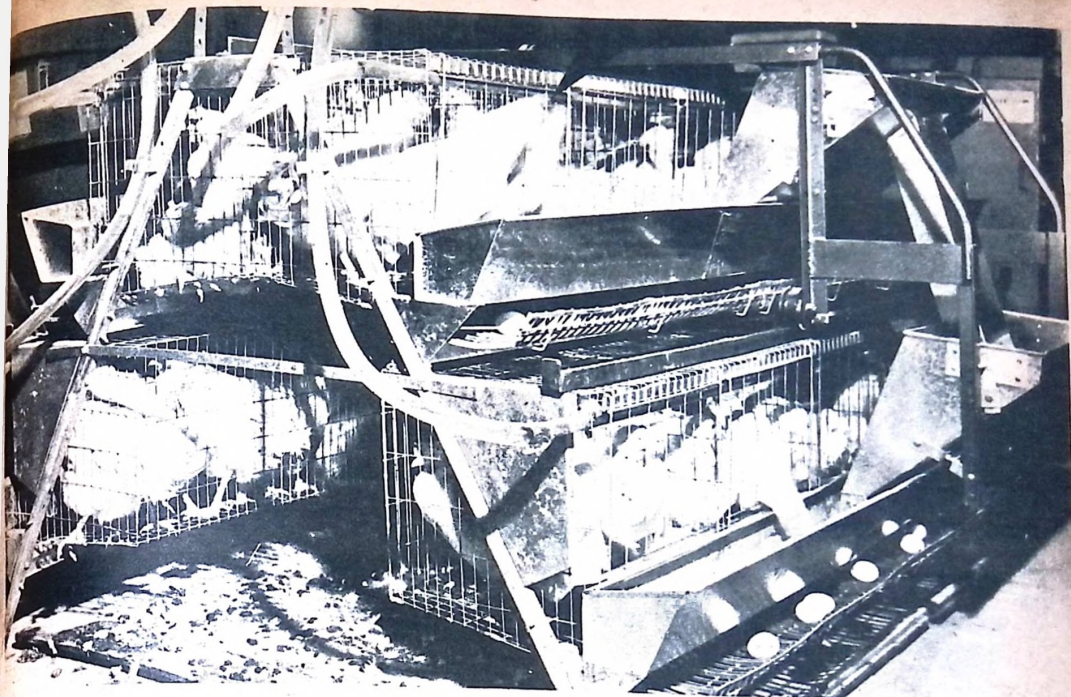
cages, which is especially important in hot climates.

The tiered cage is most popular in Britain and other temperate climates. Its advantages:-

- (1) The cages take up much less space than any other system, so reducing the cost of housing, which is expensive in cold climates where the birds have to be



A general view of one of the departments of the Zarya poultry farm in the Krasnoyarsk Territory (Siberia)



## Automatic Poultry Farm

The Zarya poultry farm in the Krasnoyarsk Territory (Siberia) will produce 35 million eggs in 1972. The farm has 330,000 chickens including 147,000 laying hens in its 30 buildings.

There are several automatic lines for the distribution of feed and for collecting eggs on this poultry farm. In the past year, three lines were commissioned, with another two in 1973. Within two years the entire factory will be transferred to the cage maintenance of poultry, thus providing for increasing the number of laying hens to 300,000 and for annually obtaining 70 million eggs.

kept warm.

- (2) The mechanisation of this type of cage is well proved, and can be used in stacks up to 200 ft. long.
- (3) The arrangement of tiers above each other makes it easier to keep the birds warm.
- (4) The type of cage is usually dearer than stepped cages, but is also usually better and therefore lasts longer.

The flat deck cage also has its special advantages.

- (1) All the birds are on the same level, and therefore get the same temperature, and the same attention from the poultry attendant.

- (2) This type of cage is as suitable for hot climates as the stepped cage.
- (3) Automatic egg collection is always included with this system.

### Varying Factors

The choice for egg laying in the Nigerian climate will therefore be, normally, between stepped cages and flat deck cages, with tiered cages being considered in special circumstances. The smaller and medium sized farmer will therefore always choose the stepped type of cage because it is cheaper in small units than the flat deck.

Continue on page 25

# Which Layout ?

Also he can easily increase the size of his farm in small units by buying another section of cages at a reasonable price.

For a small unit the advantages of the flat deck in case of supervision and automatic egg collection are of no importance. The large scale egg producer will want to compare the two systems. In comparing them he will find that the stepped cage is cheaper to buy, but because it is usually less well built, it will probably not last so long, and may cost more per year of use that he gets from it.

In favour of the flat deck will be that it is easier to work in large units than stepped cages. A

lot of the work can be mechanised, leaving the poultrymen free to attend to the birds, instead of spending their time carrying things.

The birds can be seen more easily so that supervision of a large unit is easier, and the flat deck system is designed for large units, whereas the stepped cage is mainly intended for small units.

Until recently there have been a number of disadvantages in flat deck cages, mainly because only a few makes have been sold. Feeding has depended on chain feeders, which can break down, or stop because of an electrical failure.

There is very little re-

serve of food in the trough with this type of feeder so the birds quickly finish what there is. Hand feeding is extremely difficult because the trough is not only small but also difficult to reach.

Then the drinking system has been old fashioned water troughs. While these are all right on small units fed by hand they are not really satisfactory on long mechanised cages, as it is difficult to get the level right, and either birds will be short of water or else some will spill into the feed trough, spoiling the food and probably causing problems with the chain feeder.

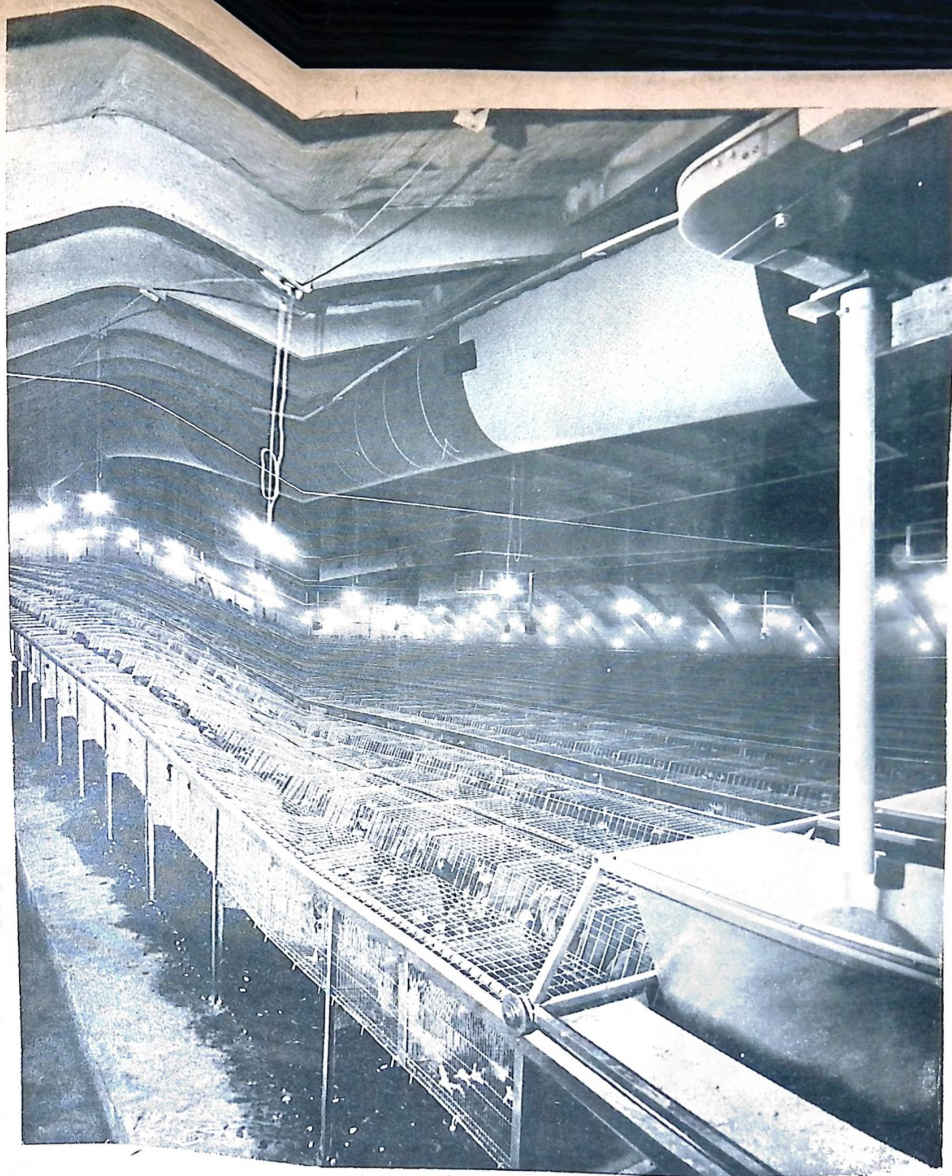
To try and overcome the disadvantages of present flat deck cages, but keep the good points of the system, one British manufacturer, Thornbers, has recently introduced a new version of the flat deck cage.

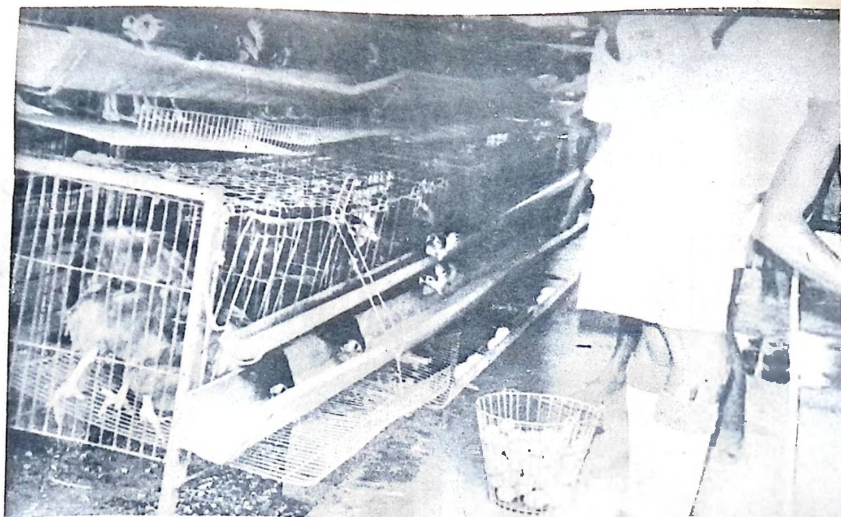
## Overlapping Advantages

This new cage has hopper feeding instead of chain feeders, so that not only is there less risk of breakdown, but if anything does go wrong with the electricity supply or the motors the birds still have plenty of food in the trough.

The hoppers can easily be pushed by hand so if the







## Which Layout for

## Battery

electricity supply fails there is no problem feeding by hand. In fact some farmers always feed by hand so they say they can inspect the birds at the same time as they push the hopper along.

Another important point is that all the birds get the same sort of feed put in front of them, whereas the chain feeder moves feed in front of one bird, then along in front of the next, and so on, so that the first birds remove the best tasting bits of the ration, and the birds at the far end get the least attractive bits.

Neither has the balanced ration the food compounder intended.

Instead of drinking troughs the new Thornber flat deck cage has the well tried nipple drinking system, which saves water, and more important, brings an absolutely fresh supply to each bird so that there is no chance of disease spreading along the water trough.

The nipples are also away from the food trough so there is no chance of water getting into the feed.

Other advantages claimed for the cage are its extra wide egg belt, wide enough to take 3 days supply of egg if necessary, though usually twice a day collections are recommended.

One farmer in Britain has already installed a 50,000 bird unit of the new cages, 15 stacks each nearly 300 feet long, in one house. Now Thornbers are trying to find out if the cage can be used to rear from day old the birds which will lay in it.

If they succeed it will be yet another factor for the farmer needing cages for 2,000 birds or more to consider.

## Cages?

### POULTRY

FOR THE CONSTRUCTION OF WOODEN BATTERY CAGES OR FIXING OF METAL BATTERY CAGES CONSULT M. JIMON CARPENTER, 10 AGENT STREET (behind Oba Iire's Palace) ILE.

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## COVER PICTURE

*Agricultural economists from Uganda show interest in trial grasses at the Welsh Plant Breeding Station, Aberystwyth, Wales.*

. See p. 14

## HARVESTING THE PLENTY

The annual wastes has begun. The final flux of grain has started all over the coastal belt. In a few months, the northern half will also be in the grain boom. Like an avalanche spilling crumbs from boulders a long path and thawing to flood foothills, maize is just thrown everywhere now. The flood is on, people eat to their gullets and throw away. Some grain just rot away.

And the sanitary squads are quickly scavenging the rubbish, nay, wasted corn, to the dust heaps.

The poor farmer just has to sell his crops. As the rains come everyone rushes to plant maize unmindful of storage problems or the necessary effort needed to stabilize prices through cooperative marketing. Each farmer needs ready cash, that's why he rushes to sell and the buyers pay any price; the buyer dictates the price now.

In a few months now the FUNFARE about maize will be over.

In this context maize, is used representatively for all grains. Dearth of these grains will set in with ever escalating prices. The farmer will then be the commander of market price.

In order to arrest this unwholesome circumstances – an uncontrolled waste at one time followed by a scramble shortly afterwards due to scarcity – a few suggestions come readily to mind.

State Governments working through COOPERATIVE or FARMERS COUNCILS should instal SILOS all over their domains to afford storage facilities to farmers. The farmer may be paid off quickly as the grains are brought in. The state bodies may then sell the grains later on with a small profit to keep the organisation going. Such profits should be minimal.

The country largely depends on grains as pointed out by a correspondent in a 'Letters to the Editor' column last month. Only a foreigner has to spend some time to know the extent to which human beings vie with animals in the consumption of grains in one form or another.

Poultry business now thriving and offering gainful employment to many depends solely on grains. If the business has to continue, there must be enough corn to stabilise it to make chickens and egg, the products of the industry, tolerably low in price for a large part of the population to be able to buy them.

The price of a bag of corn now is roughly ₹ 30 . We have to think in terms of a bag since the ordinary petty trader who makes native snacks and confectioneries buys only a bag periodically.

No economy is sound which does not consider such humble citizens. Why? Such do not qualify for bank loans or overdrafts.

So, since they have to fend for themselves, it then devolves on the Government to make life as easy as possible by making their needs ready and near to them at reasonable prices.

Storage is our main headache now. The government must now exploit ways and means of curing the headache.

# THE BIG LIVER DISEASE

by **LESLIE J. ELMSLIE M.A. (Cantab)**

*Specialising in Agric.*

**B**ig Liver Disease is a disease of layers, though it can sometimes affect birds in the later part liver, often spotted or discoloured, and un-naturally soft. The cause is a group of viruses which infect birds, and are collectively called the Avian Leucosis Complex Viruses.

*As well as the liver other parts of the bird, including the spleen, kidneys, mesentery, and other parts can be affected, and also become large and un-natural looking.*

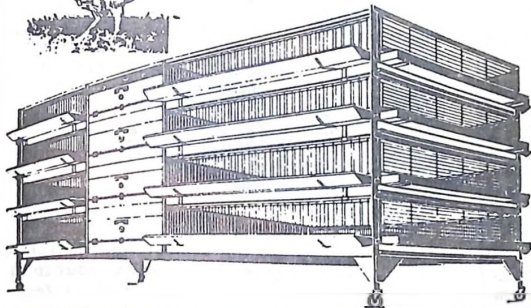
Birds which die of the disease are usually thin, and have pale, bloodless comb and wattles.

There are two less common types the Avian Leucosis Complex which we can also discuss here. One is Pearly Eye. The symptoms are just as the name says. One eye becomes useless, and looks pearly.



The other is Marble Bone. The symptoms are very thick bones, usually in the

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leg. Marble Bone sometimes affects a few broilers, and causes loss in the United States, where birds which have it cannot be sold for food.

Pearly Eye usually affects young layers, and only a small proportion of the flock.

Formerly Mareks Disease was included in Avian Leucosis Complex, but is now thought to be a separate disease entirely.

Deaths from Big liver disease do not come as a sudden epidemic. Some birds will be seen at point of lay with the disease, and deaths will continue all through the laying period.

As far as is known every flock of layers will have at least some of the disease, but the amount varies a lot.

Some flocks lose only very rare birds, others may lose up to 15% or even more. On average the disease causes one third of all deaths in layers. There is quite a lot of difference between breeds in the amount of Big Liver disease and there is also a lot of difference between farms, depending on how the birds are reared.

## TREATMENT

Since Big Liver disease is caused by a virus there is no treatment which is of any use. There is also no vaccine. Prevention consists in trying to prevent infection entering the flock, and in using resistant types of bird.

Both are necessary The way to prevent infection entering the flock is to rear chicks in isolation from layers, and also away from older birds.

The disease was very much of a mystery to both vets and poultrymen until 1960 when Rubin managed to grow the virus in his laboratory in California, and

found ways of testing to see whether birds had it or not.

He found that many birds had the virus without showing any symptoms, and that others show symptoms only after a long time. Most chicks carry antibodies from their mothers which help to protect them for some time after they are hatched, but a small percentage also carry the virus from their mother.

Important research work into this disease is also carried out at East Lansing, Michigan. Research workers there found that they could breed resistant and susceptible lines of birds. They also found that they could keep susceptible birds isolated from all contact with other birds, and keep them free of the disease.

*Big Liver disease is not at all dangerous to people, and the birds from a flock which has high mortality from the disease are quite safe to eat. The best thing a farmer who has a lot of trouble from the disease can do is to watch carefully for birds going out of lay, and to sell these as culls at once.*

There is some risk that viruses of the leucosis complex may be spread by live vaccines made from eggs, for example Newcastle disease virus. This risk is avoided if the vaccine is grown in tissue culture instead of in eggs.

Alternatively eggs from birds tested for freedom from virus of the complex by the COFAL test may be used to make the vaccines.

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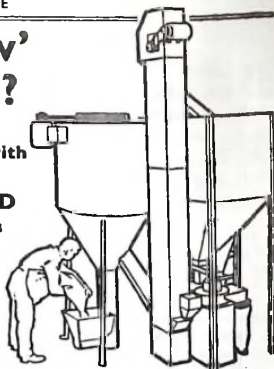
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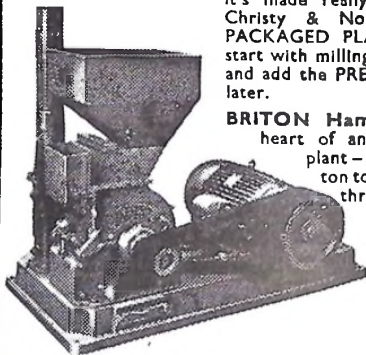
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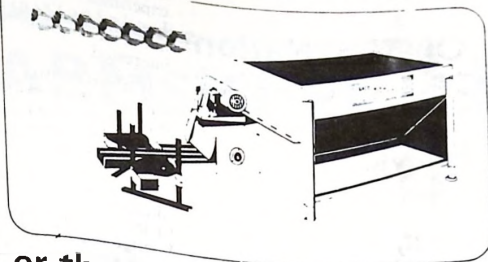
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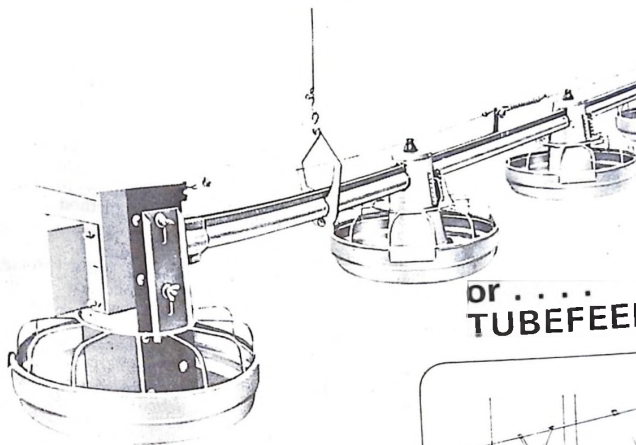
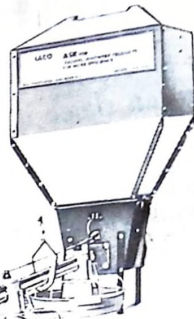
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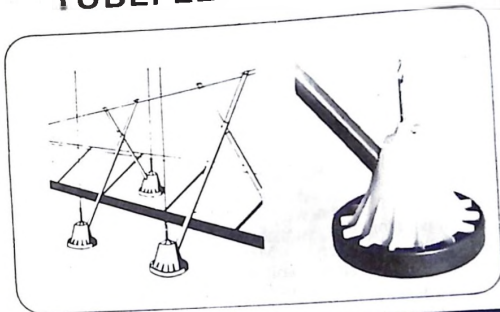
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# 'NEPA' In The Service Of The Nation YOUR GARDEN IS IN FOR A SHOCK

*Pass an electric current through a plant, says an expert, and you can shock it to triple its yield in size and number.*

*When you buy a pound of foreign tomatoes at your greengrocer's nowadays they may have been picked from plants that have been given electric shock instead of being nourished on fertiliser.*

After several years of experiments, a Sussex nurseryman has persuaded plant scientists that he can double his crop of tomatoes this way. Gordon Linfield is no wild enthusiast or crank. He has his feet firmly planted on the Sussex ground. He has been growing tomatoes for over fifty years near Worthing, but his great achievement is the mushroom growing concern he and his brother run.

In the little hamlet of Thakeham, a few miles inland from the holiday-makers' coast, they have built up, quite late in life, the biggest mushroom farm in Europe. Their mushroom beds cover many acres, and some 600 people are employed there.

Mr. Linfield has been compiling results from various seasons until now when he has a library of such records.

## Inspiration

An article in a scientific paper gave him the idea. Wheat had been grown and ripened in Finland, he learned, within the Arctic circle in a much shorter season than in England. And the reason for this was that the

plants responded to an electric influence which plants nearer the Pole receive and which makes it possible to grow monster cabbages there in a matter of weeks.

If wheat likes electricity, he thought, why shouldn't tomatoes? The commercial demand for them seemed insatiable. Perhaps this would be a way of increasing production.

He raised a batch of seedlings and divide! them into two equal groups. One set he grew in the conventional way, repotting them into larger and larger pots as they grew and using a richer soil mixture each time. To the others he administered an electric shock as well as giving them the orthodox treatment.

## Electric Charge

Metal plates were set in the soil at top and bottom of the pots and connected with an old induction coil, connected in its turn to a bicycle lamp battery—just the kind or contrivance, in fact, one used to play with at boys' parties, trying to get a penny out of a bowl of water holding one metal handle from the coil while the other was submerged.

The plants thrived on it. As they grew, their foliage took on a richer green than their companion plants. Their root systems were much more vigorous.

"And if you get good root growth on tomatoes," said Mr. Linfield, "you get good crops."

Each picking from both sets of plants was carefully weighed and entered on a chart. The first results were encouraging and Mr. Linfield decided to continue the treatment until cropping ceased. So he then supplanted the bicycle-lamp battery with current from the mains, running it through a transformer to reduce it to four volts.

"As I took out the sideshoots, he said, "sparks would jump to my fingers. I used to go into the greenhouse (unnecessary in the tropics-Ed.) at night, and as the wind stirred the plants when I opened the door, sparks would fly off where the leaves touched. It was really very pretty".

## Encouraging Results

If the equipment was improvised, there was nothing gimcrack about the results. In the first season the electrified plants gave half as much again as the untreated ones. Next year the difference was greater still.

Other growers whom Mr. Linfield told about his experiment were sceptical. Local electricity board officials were mildly interested.

A third season's trials repeated the pattern, with still better yield as small adjustments were made in the technique.

"The fourth season," Mr. Linfield told me, "I decided to let them have their heads. I left most of the sideshoots on to crop and tied them in.

Treated plants gave an average of fifty six lb. each against twenty lb. from untreated ones.

"I don't think I could do better. Someone else who understands the subject more thoroughly must carry on from here".

Does he think the amateur gardener with a small space could provide more tomatoes for his family by this method?

"I'm sure he could. I'm a complete amateur at this myself. But I wouldn't advise anyone to apply electrical current without skilled advice and inspection. I foresee the principle applied commercially, perhaps, in specially-made insulated beds."

Asked if perhaps the same could have been achieved by feeding the plants heavily, Mr. Lindfield replied.

"I don't think so," he said. "My job is to get the heaviest yields I can for every square foot of space I have. I know how to feed up a tomato crop. My control plants we grow here for market. But for all the manure they had, they didn't flourish like the electrified plants. And we're not short of good manure in this part of Sussex," he added. Linfield's dung-moving machines handle 200 tons a day.

# Laugh!

## FARMSTOCK

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**O**n one of the glass panels of the main door into a large store, I encountered a small yellow sticker which read: "By the time you have finished reading this, you will have made an idiot of yourself going round and round and round and round in this revolving door".

X X X

**T**he fortune-teller, after demanding ₦10, told her patron that he was entitled to ask two questions.

"But isn't that a great deal of money for just two questions?" the man asked.

"Yes", acknowledged the fortune teller. Second question, please.

X X X

**M**iddle age is the time of life when a man can get exhausted simply by wrestling with his conscience.

X X X

**M**oney doesn't make a fool out of a man nearly as often as a girl makes money out of a fool.

X X X

**W**hen a woman asks to see something more expensive she's shopping; when she asks to see something cheaper, she's buying.

X X X

**A** gang of clever robbers was busy counting piles of banknotes—booty from a successful bank raid—when one of the counters gasping for breath muttered, "Stop counting, let's ring up the bank and ask how much is missing"

**T**he Music had just stopped at one of those dances where each partner twists around individually as he sees fit. As a youth walked off the floor, a girl rushed up to him and thanked him for the dance. "I wasn't dancing with you," the young man hastily replied, "I was trying to get past you to the bar".

X X X

**A** married man is a bachelor who didn't notice when a girl closed the escape hatch

X X X

**O**ne man used to spin a long wind tale about his invention of a marvellous life-like scare-crow. It was made of tin, he said, and not only waved its arms at regular intervals but emitted a loud yell every few minutes. "Did it scare the crow," he was asked.

"Sheer the crows?" he cried "I should say I did. Why, gentlemen, that contraption skeered the crows so bad that some 'ems fetched back corn they had stolen two years before"

X X X

**W**hile he was finding accommodation near his new office in Bombay, a general's two daughters stayed temporarily at Delhi's well-known and some what expensive—Maidens Hotel. The general's communication staff were delighted when their commanding Officer received a signal reading, "SEND FUNDS URGENTLY OR CAN NO LONGER STAY MAIDENS"

## LETTERS

### USE LOCAL RAW MATERIALS

Dear Sir,

*The rate at which industries are springing up in the country augurs well for the future. One may hope that unemployment will diminish as currency circulates evenly.*

But one salient point that agrees more on these points,

may elude the powers granting licences for the establishment of new industries is the duplication of business.

It is usual for our people to go the easy way.

As soon as a neighbour starts a line of business, all others will open up similar ventures and flood the market with similar wares while other items are not available.

It is in the light of such anomalies that it becomes expedient to specify what industries are wanted. The Government must not allow whims to play on the public.

Local raw materials should be considered first. More often than not raw materials are brought from overseas.

Our farms are littered with a variety of raw materials which if absorbed by industries will boost our economy via employment.

A case in view is egg. It is one important ingredient in the making of paints. At the moment paints are brought in ready made in powder form. Our men do only the mixing. Our eggs should be good for the paints to adorn our houses.

LAGOS O. Oylnade  
Editor's Note: We cannot

### PUT ME ON YOUR LIST

Dear Sir,

I came across the FARMSTOCK a magazine for breeders' and farmers' while on a visit to a friend.

I was highly impressed as I read the contents hence I decided to write for it.

I enclose herewith a postal order to the value of two shillings (2/-) being a copy price as indicated on the magazine for the current publication.

I shall be grateful for your prompt attention it will also interest me to have full information about the magazine and if possible to collect the previous ones.

On receipt of the paid for, I shall order for future copies.

Mr. A. O. Ogbonna

Rural Education Centre  
P. M. B. 1010,  
Uruahia, East C. St.

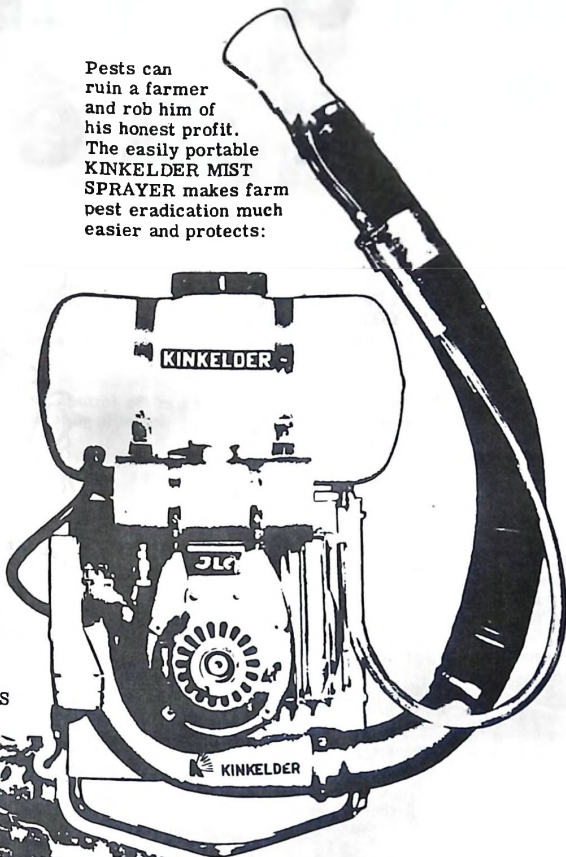
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# The Veterinarian and the farmer

**THE VETERINARY SERVICES AS A PROFESSION, DEAL WITH DIAGNOSIS, PREVENTION AND TREATMENT OF ANIMAL DISEASES WITH A VIEW TO PREVENTING THOSE DISEASES OF ANIMAL THAT CAN BE TRANSMITTED TO THE FARMER.**

*These, in addition to efforts at improved animal husbandry, breeding and feeding, help the production of disease-free and high yielding animals.*

The livestock farmer can then be sure of increased earning power while contributing his own quota to the development of the nation by supplying the much needed proteins, for improved national output and prevention of malnutrition.

## THE SERVICES

The veterinary services open to the farmer include:

- (a) Specific treatment of diseases of animals other than man.
- (b) Routine vaccination of livestock, pets, and poultry against such high killing diseases like Rinderpest (cattle plague), Rabies in dogs and Newcastle disease of poultry.

(c) Production of healthy animals capable of producing good hides and skins for a better leather industry.

(d) Meat inspection to prevent man from eating such diseased meat from which diseases like tuberculosis, contagious abortion (brucellosis) and pork tapeworm may be acquired.

## DISEASES

Perhaps, the greatest parasitic killer of cattle in this part of the world is a blood parasite called Trypanosome which is carried from one animal to the other by the tsetse-fly.

This parasite causes the sleeping sickness of cattle called "Nagana". The veterinary services are working hard to eradicate this disease.

*Other diseases of interest in this part of the world*

*which are important in livestock rearing for profit*

*Rinderpest (cattle*

*Undulant fever),*

*Mastitis in dairy cows, Contagious ovine pleuro-*

*Foot disease,*

*Erysipelothricosis,*

*Coccidiosis,*

*Newcastle disease and*

*Babesiosis.*

## LIVESTOCK

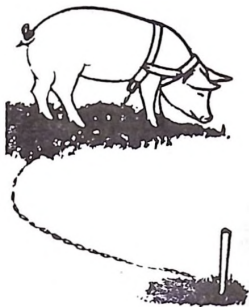
A recent responsibility of the vets involves the commercial culture of fish in many countries. Thousands of pounds of fish are being harvested for human consumption from these ponds,

The dairy farmer stands to gain and obtains maximum level of milk production from the cows when the udders are free of diseases. The beef farmer is helped



*My lady shouts for eggs only always . . . but for the Vetman*

# an Services



*They give me rubbish; but the vetman insists on a good diet for me.*

to produce the best animals with ideal beef conformation and marketable appearance by regular deworming exercises and by

active control of many debilitating diseases.

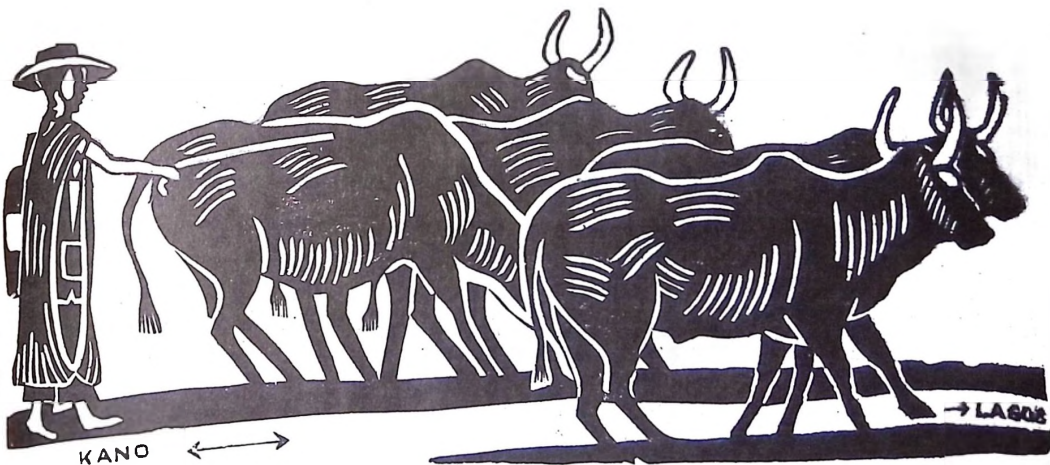
Poultry farmers are helped by protecting the birds

from such disease as fowl plague, fowl pox, fowl cholera, newcastle disease with the relevant vaccines against these diseases.

Advice on correct management procedures, preventive treatment approaches are given on possible outbreak of major bird diseases.

## PETS

Care of pets like dogs which act as watch-dogs, comes within the economic realization of the farmer. These dogs help to fight off both animals and man marauders who come during the night to kill or steal the farmer's animals. The livestock farmer will stand to gain by making friends with the Veterinarians near him.



October 1974 *I take a lot of beating even when grazing, what about the trek? Only the Vetman frowns at all this.*

# THE NSDO: A UNIQUE SEED MARKETING ORGANISATION

by Ronald Webber,  
a London horticultural journalist

**B**ritain's National Seed Development Organisation (NSDO), a body which acts as marketing agent for new crop varieties produced by 14 State-aided plant breeding stations, is not only unique in its field but is also proving to be an all-round success.

NSDO was set up (at Newton Hall, Cambridge, eastern England) to ensure that the products of the State breeding stations should also be eligible for protection and so avoid unfair competition with commercial breeders.

At the same time it was expected to provide a return to the taxpayer on the public investment in this aspect of research.

## Run Commercially

NSDO operates on commercial lines and aims to secure the best possible return for its activities consistent with maintaining high standards and the reputation of State-bred varieties.

Its policy is to promote within the United Kingdom and overseas the use of these varieties. It is a link through which the products of research are transmitted to the industry.

It is responsible for multiplying, promoting and marketing new and existing State-bred varieties, licensing, collecting royalties and sponsoring the testing of varieties at home and abroad.

It is also involved in the patenting of plant breeding techniques evolved at the research stations and in the licensing of their use.

## Limited Production

Production at the NSDO is normally limited to the growing of the

basic seeds and plants of the varieties for which it is responsible.

These are then sold to the seeds and nursery industry for further multiplication to produce seeds and plants in the quantities and quality required by farmers and growers.

NSDO is in a very healthy financial position. United Kingdom income for 1972-3 was £140,000 for sales of basic seed and £150,000 for royalties, compared with the previous year's figures of £80,000 and £85,000 respectively.

The largest proportion of royalties at present comes from cereals, particularly from the Maris varieties of winter wheat bred at the Plant Breeding Institute at Cambridge. These last year won for the Institute a Queen's award to Industry, the first time this has been awarded for plant breeding and in itself a recognition of the value of these high-yielding wheat varieties in helping to combat the current world grain shortage.

Significant for the future is the fact that one of the most popular of the varieties, Maris Huntsman, has been added to the French variety list - the first British-bred winter wheat to be so approved. It is important because France is the largest cereal producer in the European Community and if Maris Huntsman gains commercial acceptance it will become a major source of foreign royalty revenue.

## Grass And Clover Breeding

With a worldwide shortage of grass and clover varieties the NSDO is doing all it can to encourage breeding in this sphere. An initial release has been made of Sabova a fine bent-grass produce by the Welsh Plant Breeding Station, the first British variety to be put into commerce.

In potatoes, Stormont Enterprise, a main crop variety bred at the Loughall Station of the Ministry of Agriculture for Northern Ireland and which offers resistance to spraying, a serious disease on certain is being marketed.

In fruit, the raspberry Glen Clova from the Scottish Horticultural Research Institute at Dundee is already grown extensively on a commercial basis in Scotland.

Other fruit includes two apples (Malling Kent and Merton Knave), two blackcurrants (Blackdown and Malling Jet), three more raspberries (Malling Admiral, Malling Delight and Malling Orion) and four strawberries (Marmion, Merton Dawn, Merton Ruby and Montrose).

## Vegetable Varieties

Vegetables include new varieties of Brussels sprouts, celery lettuce, parsnip, red beet, tomato, cucumber bean, cauliflower, cabbage, marrow swede, forage rape, fodder radish oil rape, sugarbeet and rhubarb.

Farmstock

For 1974 NSDO has taken a new step in that it is offering to private gardeners a few of the vegetable varieties which up till now have been available only to commercial growers

It is doing this through the British Group of the International Garden Centre Association whose 110 members throughout Britain will provide the outlets.

### *Overseas Expansion*

An association has been formed with the Royal Botanic Garden at Kew, London, to develop some interesting hybrids of aloe which, it is considered, will make excellent houseplants. And streptocarpus bred by the John Innes Institute at Norwich, eastern England, and Regal lilies from the Scottish Horticultural Research Station are also being handled.

Overseas trading is expanding steadily, particularly in Denmark, Ireland, France, Belgium. Sweden, Netherlands, Poland, Hungary, Austria, Switzerland, Federal Germany and Italy.

Besides the Maris Huntsman winter wheat for France already mentioned, Maris Templar winter wheat has been accepted by Denmark, two winter oats, Maris Quest and Peniarth, have received approval in Switzerland for use in the milder areas and Mostyn spring oats approved in Belgium. Maris Kestrel kale and the Timothy grass Aberystwyth S50 have been put on the Swedish official list and Nevin forage rape added to the Federal German list.

In addition to submitting varieties of all species for official tests in many countries, NSDO is actively collaborating with many private companies overseas for testing of varieties and of possible subsequent commercial development of those varieties which show promise.

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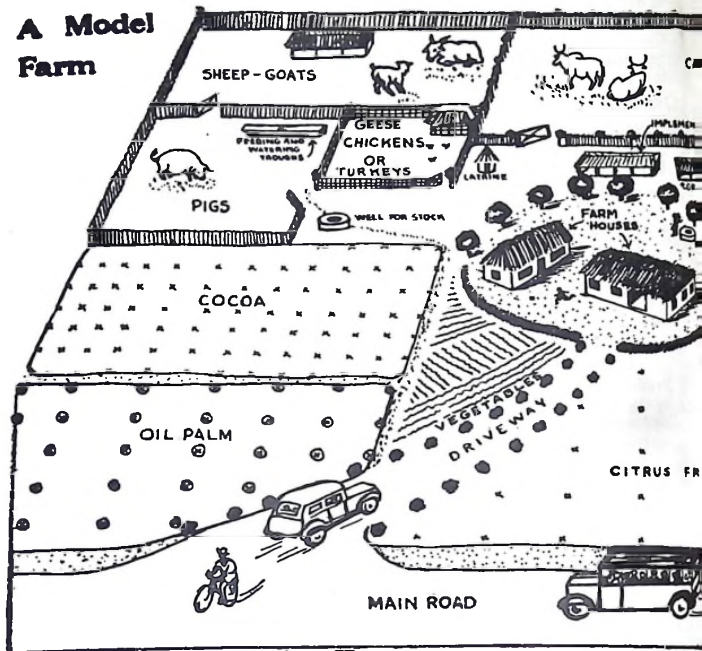
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## A Model Farm



# WHAT COLLECTIVE

by Y. Yu

**T**here are some 30,000 collective farms in the USSR. A Soviet collective farm is based on voluntary amalgamation of working peasants for jointly conducting large-scale social production on the land belonging to the state.

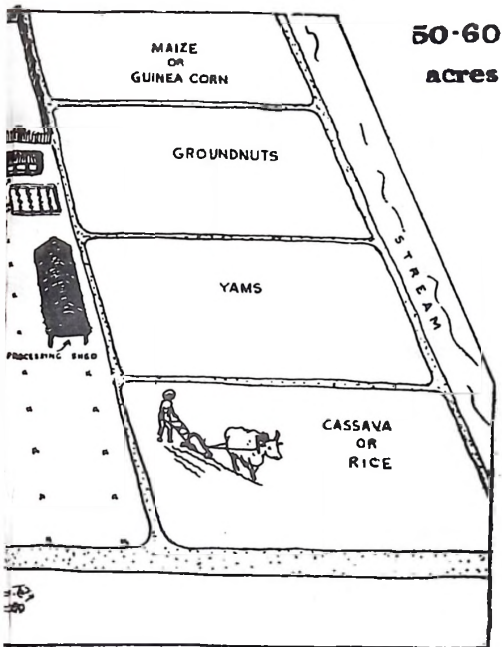
Every collective farm has its own Rules, drawn up on the basis of the Model Rules of the Collective Farm. The present Model Rules were approved, after a nation-wide discus-

ssion, by the Third All-Union Congress of Collective Farmers in 1969. Thus a collective farm presents a comparatively independent self-governing system where the collective, on the basis of the collective farm Rules, makes its own decisions on basic problems concerning production, social and cultural life. A collective farm develops production on the basis of the plan approved by its members.

Hence, governing of people means of

How are State collective farms on and the ap Thus the

Farmstock



50-60  
acres

tribution of the income. Thus centralised guidance is combined with the initiative and independence of an individual collective.

By providing collective farms with plans-contracts for the sale of produce the state at the same time sees to material basis for their fulfilment: It also plans the delivery of farming machines, mineral fertilisers, building materials, etc.

How do collective farmers run their socialized production? The bodies of collective farm self-administration include the general meeting of collective farm members, the collective farm board, its chairman and the auditing commission. The general meeting is the highest managerial body: it has both administrative and executive functions: its decisions are obligatory for all collective farmers.

A general meeting elects the board, the chairman of the collective farm and the auditing commission for a three-year term.

The chairman of the collective farm in his daily activities carries out the will of the general meeting and the board. The position of chairman is a responsible job to which the most experienced and educated collective farmers are elected. Today more than 80 percent of all collective farm chairmen have a higher or secondary education.

## S A FARM?

ive farm is a self-  
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ive farms managed?  
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purchase plans, contracts price-formation and a system of bank credits regulates and provides incentives for the activities of collective farms. At the same time the collective farmers, on receiving from the state an order-plan for the sale of one or other type of farm produce, decide what crops should be sown, the area under them, what livestock should be bred, plan the volume of production, expenditure, receipts and the distri-

# Big-operator small dairy

**A** British farming magazine and four farmers have joined forces in one of the most ambitious experiments in co-operation ever undertaken in British agriculture.

by **MICHAEL WILLIAMS**  
*"Farmers Weekly", London*

*The experiment is dairy unit for 600 milkers, with an option for expansion to an eventual total of 1,000 milkers. It has been planned and developed to investigate a possible system of milk production for the future, and take advantage of the Government finance available in Britain for co-operation in farming.*

It is called a cotel a kind of cow hotel.

But although the project is pioneering new ideas, it must also be strictly commercial.

All five partners are risking substantial investment and are expecting a worthwhile economic return.

## Advanced Techniques

The magazine, "Farmers Weekly", runs a total of seven commercial farms. These are used to investigate advanced techniques of production, and between them, these attract thousands of visitors a year.

Asclin Cotel, the new giant dairy unit, is another step in the same direction. Many farmers in Britain are expecting more difficult economic conditions in the future, especially for dairy farming.

Production costs are rising steadily, especially the cost of labour; (and labour itself is becoming scarcer), while product prices are remaining remarkably stable

Two types of farm are widely considered to be best placed to meet this trend. These are the efficient smaller units with 40 to 70 cows, where capital investment is low and family labour is used substantially, and, at the other extreme, very large units which can afford professional management and can benefit from economies of scale.

Co-operative farming enterprises in Britain are more of a novelty than in some European countries. This is partly because the average size of farms in Britain, at about 70 acres (28 hectares) has produced a less crucial small-farm problem.

"Farmers Weekly" decided that co-operation in dairy farming could give a number of farmers a share in the advantage of large-scale operation. The idea was suggested to a group of farmers near the Buckinghamshire village of Aston Clinton, an area in which the magazine was already running a dairy farm.

Four of these farmers were keen to co-operate and agreed to the Asclin Cotel.

Farmstock

# benefits for farmers

Hammond, who produced milk from nearly 450 acres (180 hectares), Mr Tom Blundell with 300 acres (120 hectares), Mr. Tony Mogford who grows mainly corn on 350 acres (140 hectares), and Mr. Sidney Parsoos, rearing calves and producing beef from 80 acres (52 hectares).

Each of the partners, including the magazine, agreed to contract part of their land to the cotel to make a total of 500 acres (202 hectares) to produce bulk feed for the herd.

For each acre he contributed, the partner also supplied ₦200 (hectare he contributed, the partner also supplied ₦494) towards the capital required, from his own resources.

## ₦420,000 To Start

An initial estimate of the total capital requirement for the unit for 600 cows, including working capital until an income was created, was ₦420,000.

Of this the partners' acreage payments supplied ₦100,000, bank loans found a further ₦200,000, and the balance was supplied by a grant from the Government-financed Central Council for Agricultural and Horticultural Co-operation.

The first estimate has since proved to be too low, partly because of cost increases, but also because of delays and difficulties over planning permission from the local authorities. A further ₦140,000 was raised, partly by a further grant from the Central Council.

The cotel's 500 acres (202 hectares) are scattered over five farms in a radius of more than five miles (eight kilometres) from the central unit.

This has meant that a zero-grazing system had to be used, with most of the feed brought into the housing unit. Similarly manure has to be removed for disposal on to the land.

A site for the housing and milking unit was purchased near the edge of Aston Clinton. This was convenient because it was central, and also because electricity, water and roads were all available.

## Public Meeting

Local residents objected strongly to the development, fearing noise, smells, fly nuisance and dirt. To meet this hostility the partners organised a public meeting in the village at which the project was fully explained.

The meeting helped to dispel some of the objections, but some resentment has survived, and this persists in spite of the extra business which the cotel has brought to local tradespeople and the attractive jobs it has created.

## Right Employment Conditions

"We chose to work together because we feel that only in this way shall we be sure of securing the resources of capital and management that will make us competitive in the future," said an article in "Farmers Weekly" announcing the project.

"This will allow us to offer conditions of employment similar to that of our industrial neighbours. Diarising on our own farms offers us less scope for expansion in the longer term."

The four farmers who joined the partnership nearly two years ago are Mr George

*Continue on page 20*

# small dairy farmers

One of the effects of the local objections was to delay the planning permission required for the cotel. Heifers and cows were bought in the spring of 1968 and early summer to calve down in the following autumn when the buildings were due to be completed.

But completion was delayed for five months and during the period the partners had 600 cows to milk in inadequate and makeshift units on their own farms.

Partly because of local feeling, special regulations were laid down for operating the cotel. The storage of manure and silage on the site is forbidden (adding to the transport problem), work at night is not allowed, except in an emergency, and liquid manure can be removed from the site only in an enclosed container.

## Special Trailers Banned

To streamline the transport problem, the partners had planned specially-designed trailers which could be used to haul slurry from the cotel centre to the farms. The trailers could then be washed with a

power hose and loaded with silage or fresh-cut material for the return journey.

The regulation requiring the use of an enclosed trailer for slurry transport made this impossible. Instead, self-unloading bulk trailers are used to bring feed into the unit.

These discharge into feed bunkers inside the houses. Slurry in the houses is scraped into a channel covered by a steel grid, to drain into a below-ground holding chamber. From there it is delivered by auger into a 1,750-gallon (7,960-litre) capacity tank mounted on a four-wheeled trailer.

The trailer is used to spread the slurry direct on to arable land when this is possible, or on to pasture. When ground conditions are too wet for spreading, the slurry is delivered directly into storage lagoons.

## Roofs Reflect Heat

The cows, 400 Friesians, Ayrshires and Friesian-crosses, plus 200 Jerseys for quality milk for retail sales, are housed in three buildings, each 214 feet (65 metres) long by 66 feet (20 metres) wide. The

buildings have wooden-clad walls, and roofs of aluminium sheeting to reflect heat and reduce the weight to be carried by the framework.

Each building has 200 cubicles made of timber, and the cows are bedded on sawdust, which is less expensive than straw, keeps the cows very much cleaner and provides less bulk to be carried as manure.

Each building can be subdivided, and the cows are housed according to yield and stage of lactation so that feed can be used according to production. The concentrate ration, fed mainly in the housing rather than in the parlour, is a highly-mineralised barley-based pellet to supplement fresh feed, and a 16 per cent protein nut for production when silage is fed.

Cropping is designed to give a long cutting period, and to provide the yields needed to supply 600 cows from 500 acres (202 hectares). It starts with rye in early spring, continues with ryegrass leys, and finishes about seven months later in early November when the last of the maize is cut.

## Short Of Target

The original target set for the cotel was a yield average of 1,000 gallons (4,546 litres) a head, to be achieved within two or three years of operation.

The milking difficulties during last winter, and the fact that more of the cows will have to be culled for yield than was anticipated, mean that yields for the first full year are likely to be lower than had been hoped for, and the average is likely to be well under 750 gallons (3,409 litres).

Policy decisions for the cotel are made at meetings of the partners. They are put into effect by a general manager, who has under him two managers—one to look after crop production and the other in charge of livestock.

The dairy herd is operated by a seven-man staff, working a five-day week. Each day two men are off work, two are looking after slurry handling and feeding, including transport, and three are milking. Calves are reared by separate staff on one of the partners' farms.

# FARM STOCK

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## PUZZLES

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The milking parlour a part of the cotel which attracts particular interest from visitors, is a herringbone unit with 36 stalls and 18 units - believed to be the largest of its kind in Britain.

The design was chosen in preference to mechanically rotating parlours because of cost, mechanical reliability, and because of the large amount of favourable information available on herringbone parlours used with very large herds, particularly from New Zealand.

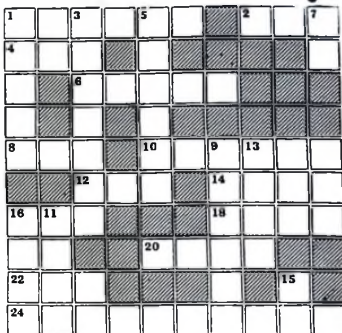
An observation platform has been installed for visitors, equipped with one-way glass windows. This allows people to watch the milking operation without disturbing the cows.

### Extendible stalls

Special equipment in the parlour includes a acid circulation cleaning for the milking units, calibrated glass milk jars installed at operators' eye level to make yield recording easy, disposable paper towels for hygiene and spray nozzles using warm water for under cleaning.

The parlour itself was deliberately designed with extra length to make adding extra stalls and units easy if required. Any new installation will now be possible without disturbing the regular milk routine.

A target for performance in the parlour was originally set at 50 cow per man-hour. The rate has been frequently exceeded and is now the accepted standard for the unit.



### CLUES ACCROSS

1. Latin name for GOAT (6)
2. UNITY (3)
4. Indian Chief (3)
6. Bulgarian City (5)
8. Tu (Italian word) (3)
10. Delete (6)
12. POUND DOWN (3)
14. Over (actual) (4)
16. Look (3)
18. Uncommon (4)
20. Simpleton (4)
22. Donkey (3)
24. Oldest man in the Bible (10)

### CLUES DOWN

1. WILD (5)
3. STANCE (7)
5. SENILE (6)
7. Elizabeth Reign (abbrev) (2)
9. SAD (6)
11. PLEASURE (4)
13. Almost round (4)
15. Master of Arts (abbrev) (2)
16. Line of sowing (4)

### RESULTS

Results will be published in our November, edition.

# BREEDING TOMORROW'S GRASSLANDS

by

JOHN PARRY

Crop specialist of "Farmer & Stockbreeder" London

**A**fter a decade of diligent breeding under the directorship of Professor P. T. Thomas (who retires later this year), a stream of high-performance grass varieties is now beginning to be released by the Welsh plant breeding Station.

Apart from their superior performance, these new varieties are important because of their potential value to many countries.

The station was established in 1919 and in its early days was run as a research department of the University College of Wales, Aberystwyth.

While still maintaining this status, today the station is fully-aided by the Agricultural Research Council. It has an annual budget of £1,600,000 and a staff of 200 - 150 of whom are scientific,

## BARLEY RESEARCH

Breeding work is not confined to grasses. Clovers, fodder crops, cereals and pulses are also produced. Recent introductions include the dewerm-resistant spring barley Sabalis, the nitrogen-tolerant white clover Sareda and the spring field bean Dafra.

Among fundamental research being carried out in the cereals section under Dr Desmond Hayes, a major activity concerns hybrid barley which, as in hybrid wheat, can exhibit a considerable degree of heterotic vigour. One objective has been to develop a genetic system to produce enough seed from a number of F1 hybrids to allow for bigger trials.

Male sterile composites from the world collection have been used in this programme to achieve higher levels of cross-pollination under field conditions. Sources include Dr. R. T. Ramage of Arizona, USA, and Dr. E. A. Hockett of Montana, USA.

An equally novel activity is the development of a new breeding technique using other cultures. The aim is to produce "haploid" plantlets from cereal pollen grains and one

problem encountered so far was the difficulty of finding a suitable growing medium.

## QUICKER BREEDING

But if all goes well it may soon be possible to produce homozygous plants quickly and directly from pollen grains. This will enable the breeder quickly to incorporate desirable characteristics into his plant material.

To return to grass, the station's traditional research subject, as with the cereal department, much of the work is fundamental. An example is the work of Dr. J. P. Cooper, who has been pushing grass to the limits of its production to find the ultimate yield potential and the limiting factors. The trial results are often based on data provided by just one extremely well fed, intensively monitored leaf

## LIGHT FACTOR

The overall limiting factor to grass production in Britain is the seasonal input of light energy, which varies ten-fold between winter and summer - from

below 30 to over 500cal/cm<sup>2</sup> of total radiation per day.

Dr. Cooper has found that at low light intensities, the photosynthetic activity of both the individual leaf and the canopy are low, corresponding to a daily dry matter production of less than 2g/m<sup>2</sup> of leaf surface, although the efficiency of conversion of these low light inputs is comparatively high (12% - 15%).

As the light intensity increases, the photosynthetic rate increases also. But in most temperate grasses, particularly in northern Europe, the individual leaf reaches light saturation at 20,000 - 30,000 lux, which is only about a third of full summer sunlight.

Further increase in light intensity has little or no effect on photosynthetic rate, so that during the high light intensities of summer, the individual leaf is able to convert only 1% - 2% of the incoming light energy, corresponding to a maximum daily dry matter production of 10g/m<sup>2</sup> of leaf surface.

#### LESS INTENSE

In the crop canopy - as opposed to the individual leaf - the incoming light transmitted and reflected down the ca-

nopy and consequently spread over a much larger leaf area, often up to a leaf area index of 7-10. As a result the average light intensity falling on each unit of leaf area is less and light saturation of the crop is reached only at much higher intensities of incoming radiation.

Under summer conditions in Britain crop growth rates of over 200kg/hectare per day, corresponding to over 5% conversion of light energy, are not uncommon. With young vegetative canopies growing at high light intensities values of over 400kg/hectare have been reported.

It is possible therefore, according to Dr Cooper, to develop predictive models of the potential photosynthesis or crop growth rate of the closed canopy. At complete light interception throughout the year, values of over 20 - 40 tons/hectare of dry matter per year have been estimated.

Maximum production is not the only characteristic on which the breeders are working. Their philosophy is not breed grasses for particular farming systems, not just for high yield. The result is the stream of new grasses designed to produce more milk or beef per acre.

rather than more dry matter than other varieties.

One of the most interesting of these grasses is Sabrina - tetraploid hybrid from a perennial and an Italian ryegrass cross. Each spring and early summer it exhibits all the characteristics of a tetraploid Italian, but from late summer onwards and into winter, it becomes a vegetative perennial type.

Another new variety is sabalan tetraploid Italian ryegrass said to be superior in yield, persistency and palatability to its competitors.

Not yet released are cocksfoots that exhibit many characteristics of a perennial ryegrass. They retain the renowned persistence of traditional cocksfoots but without the usual drawbacks of low digestibility and intake.

Many of the new grasses are already on trials in most European countries and in North America. They could soon find a place in many of the world's temperate grassland regions.



**WATCH OUT FOR  
A BRAND NEW SET OF**

**POULTRY**

**DRUGS**

PUTTING ANIMALS ON

# "THE PILL"

FAMILY PLANNING IS BY NO MEANS CONFINED TO HUMAN BEINGS THESE DAYS. IN BRITAIN VARIOUS FORMS OF "FAMILY PLANNING" OR BREEDING CONTROL OF ANIMALS ARE WIDELY PRACTISED, EITHER FOR ANIMAL WELFARE OR ECONOMIC REASONS - OFTEN FOR BOTH.

The most recent form is the introduction of an oral contraceptive for dogs - a birth pill which has many advantages. It is the first satisfactory oral method of birth control found for animals, and as there are some 4,000,000 dogs in Britain it has enormous potential.

## Unwanted Puppies

Perhaps its most important function will be to prevent the birth of many thousands of unwanted puppies - the result of unplanned mating - that are destroyed every year soon after they are born.

The pill suppresses "heat" and the often distressing and inconvenient problems it brings. It also prevents conception should mating occur.

By giving the course of treatment to a bitch enables the owner to control her breeding and to space her litters. A longer course will postpone "heat" to avoid interference with holidays, travel or dog shows.

As the pill has a yeast base it is readily eaten, and tests on 250 bitches before it was marketed confirmed that it had no serious side effects. However, correct dosage and administration are vital, and because of this the pill is available in Britain only through veterinary surgeons.

by  
**Peter Bullen**  
*Agric Correspondent of  
"THE DAILY MAIL"  
London.*



*Ovarid, Glaxo's new contraceptive pill for dogs, being administered to an Alsatian bitch.*

## Sponge Pessary For Sheep

On farms, synthetic hormones to control breeding in sheep have been used for two years. A device was first marketed in April 1967 after tests on 5,000 ewes from 18 different breeds had shown that "family planning" could make a valuable contribution to sheep rearing in some conditions.

The device is a small sponge pessary, impregnated with the hormone, which is placed inside the ewe's genital tract and enables the shepherd to plan the breeding of the flock with precision.

All the ewes can be persuaded to mate and eventually to lamb at the same time, so that lambing lasts for a few days instead of straggling on for weeks.

For countries which have a large sheep population, particularly if artificial insemination is being used, the ability to control the breeding pattern of ewes could be very beneficial.

Apart from the value of condensing mating and lambing times and making the breeding pattern more predictable, the method has another advantage in countries where sheep are reared for meat. It enables the breeding season to be brought forward by several weeks so that the lamb crop arrives before the traditional time.

As early-season lamb prices are generally the highest it could pay some flock owners to be first to market with their lambs. Of course, if everyone switches to early marketing the advantage rapidly disappears.

## More Rams Needed

Results with sheep have been inconsistent in Britain, probably because of the large number of different breeds - there are more than 40; but there would not be such a drawback in countries where there are fewer breeds.

The technique of controlling or synchronising oestrus or "heat" in ewes also makes it necessary to have one ram for every ten to 20 ewes.

Continue on p. 26

## “THE PILL”

Again, this is not typical in Britain, where one ram to 40 or 50 ewes is generally felt to be sufficient.

Where it is not economically possible to have more rams, and they cannot be borrowed or hired, artificial insemination (a.i.) may become more popular. This is particularly likely where a breeder wants to make use of top quality rams to make a rapid improvement in his whole flock.

It has always been the most obvious advantage of A. I. that it enables a small number of top quality male animals to be used on an exceptionally large number of females, with often startling results. More meat, milk or wool can be obtained in a reasonably short time by herd or flock improvement through A. I.

### Pressure on output

Control over the female's breeding cycle makes A. I. even accurate and effective, and it should lead to increased use of both techniques as world-wide pressure grows to increase farm output and productivity.

The same pressure is forcing livestock production in many countries to become more intensive, with vast numbers of animals being housed and fed on fewer and fewer acres (hectares).

In these big beeflots and milk “factories”, or in the large pig production units, controlled breeding could enable farmers to utilise their labour, machinery and buildings even more effectively.

ly. Synchronisation of cattle mating (either natural mating or through A. I.) and calving, could be timed to achieve maximum output of milk or beef at the period when market prices are the most attractive.

At present there are no “birth pills” or other control devices for cattle on the market in Britain although several of the major pharmaceutical firms are working on the project.

### No Problem With Pigs:

In pigs there is not the same need for artificial control of breeding in a adult sows, as oestrus can be regulated very successfully by weaning groups of sows on the same day. About 80 per cent will exhibit oestrus within four days.

In gilts there has been difficulty in spotting the correct time for a.i. but this problem has been overcome by a compound given in the gilt's feed to control oestrus.

The makers have also produced a similar compound which, when given to poultry, stimulates the birds to moult by controlling ovulation.

**Manufacturers referred to:**  
**Oravid pill for dogs - Glaxo Laboratories Ltd., Greenford, Middlesex.**

**Synco-Mate for sheep - G. D. Searle and Company Ltd., Lane End Road, High Wycombe, Buckinghamshire**

**Pig and poultry compounds - Imperial Chemical Industries Ltd., Millbank, London, S. W. 1.**

## FARMSTOCK

becomes a West African Agricultural paper from next month—

November '74.

Read a full report with pictures of Ghana's first AGRICULTURAL FESTIVAL in that edition.

-Managing Editor

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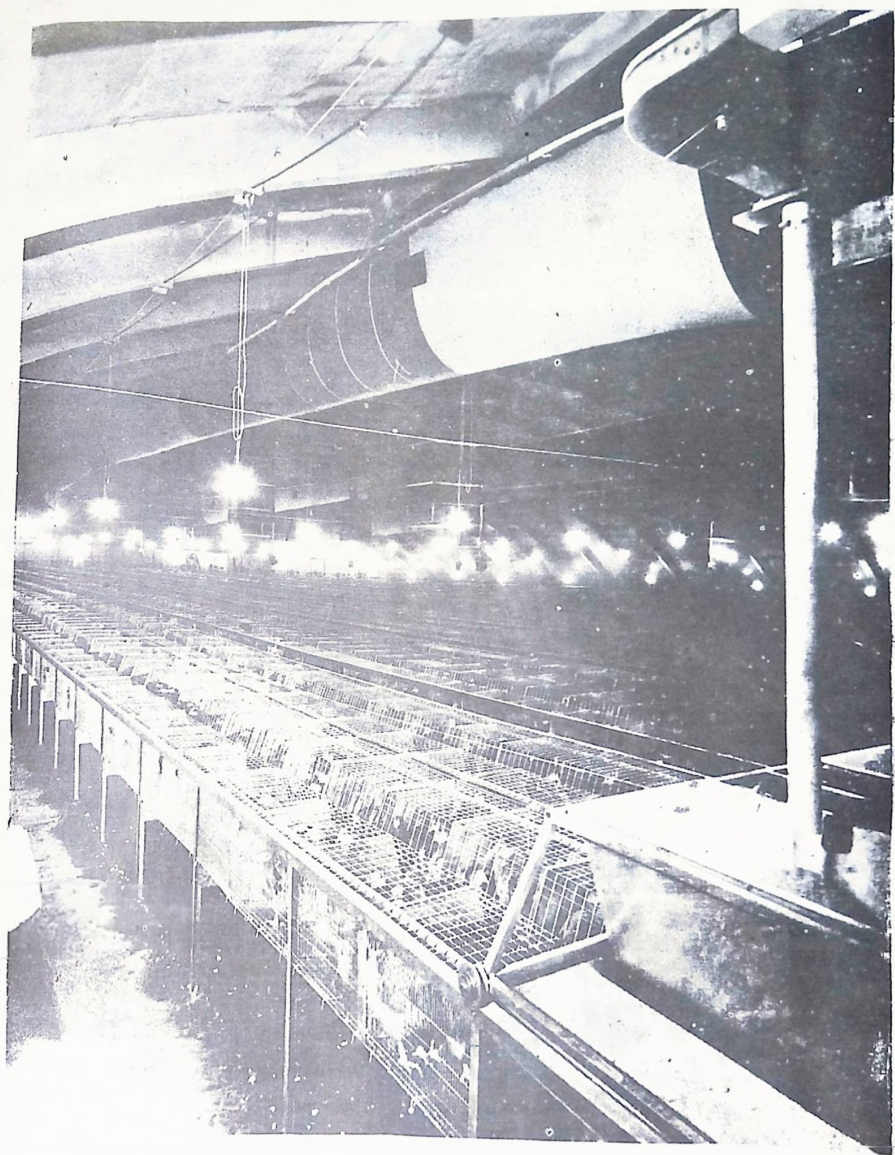
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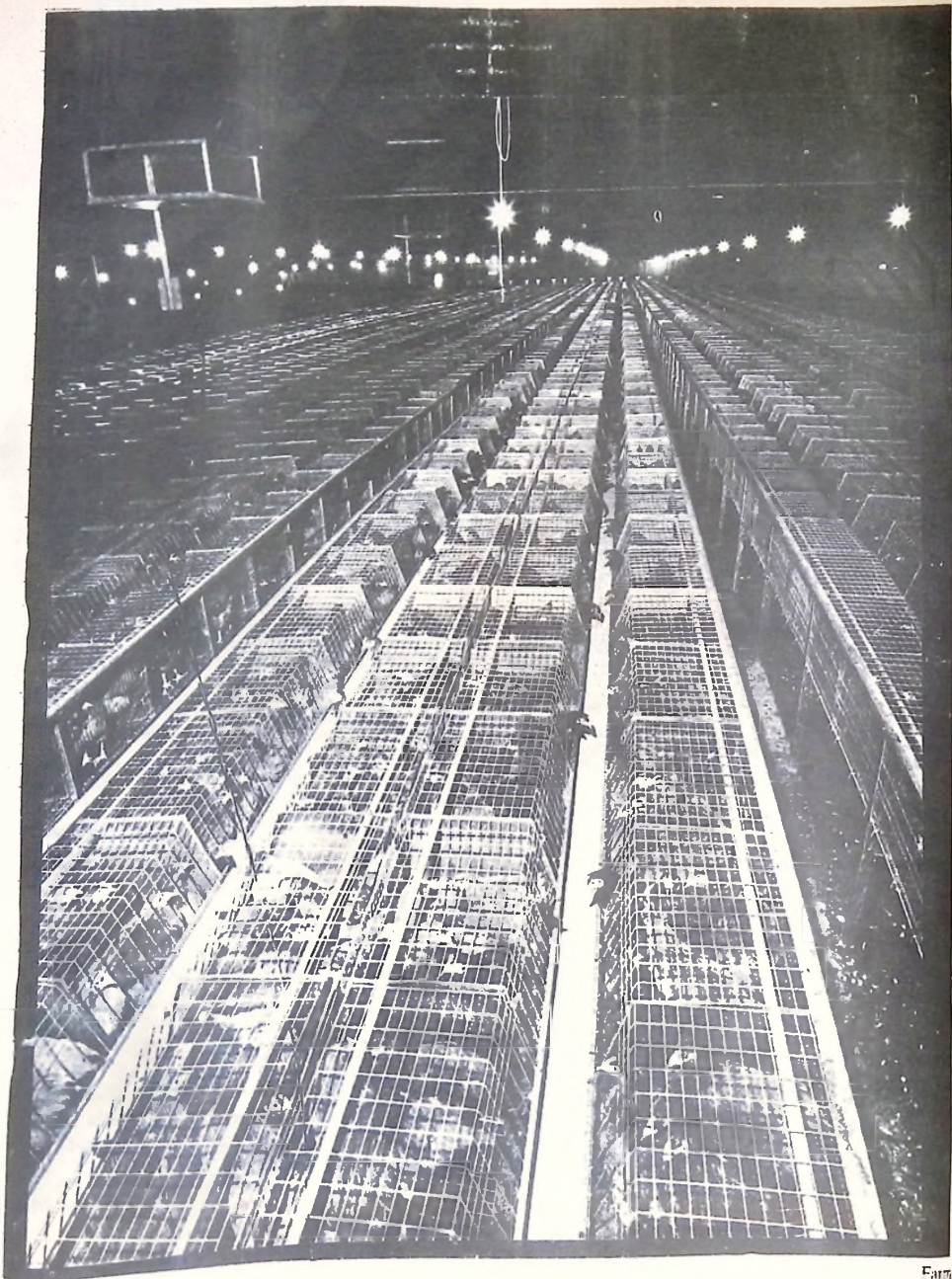




A general view of one of the departments of the Zarya poultry farm in the Krasnoyarsk Territory (Siberia)

Farmstock





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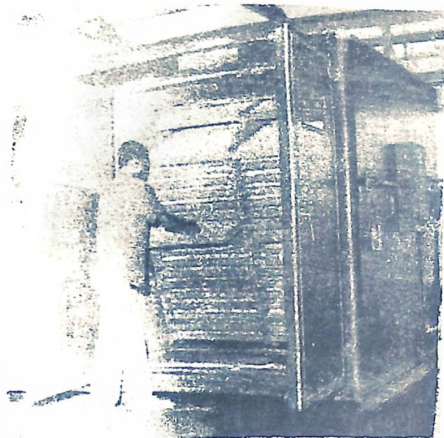
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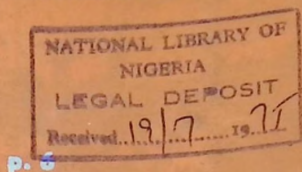
# FARMSTOCK

WEST AFRICAN FARMERS' & COOPERATIVES' MONTHLY

JUNE 75

PRICE 35k

AGRICULTURE  
IN W.AFRICA



p. 5

GHANA PLANS  
INTERNATIONAL  
TRADE FAIR

p. 9

SCHOOL FARMS

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p. SERIALS & DOCUMENTS  
RECORD SECTION

FARMING BY T.V

p. 23



90W  
2/13/75



A pond of the mechanised complex for duck cramming at the Kirov Collective Farm of the Village of Novominskaya, Krasnodar Territory. USSR.

# cover Pix

NEW LIVESTOCK WEIGHER FOR  
SMALL ANIMALS

A new mobile livestock weigher, the 'Multiway' designed specifically for small animals, weighing up to 400 lb (180 kg), has been introduced by a British Company and is being exhibited at this year's Royal Show at Stoneleigh, Warwickshire, in the English Midlands.

The Multiway has a tubular steel frame sheeted on either side and the weigher is mounted on an advanced suspension system incorporating four join balls at the top and four at the bottom, for accurate weighing. Spring-loaded gates at both ends can be operated from either side. The scales can be turned through 360 degrees for reading from any angle and the operating level can be fitted for working from either side. The wheels operate when the weigher handles are raised.

One of the main themes of the 1974 Royal Show—Britain's premier agricultural exhibition—is Fuel Economy. The number of trade stands is up to 721 from last year's figure of 678 and many countries have extended their international pavilion areas. In the case of Canada and Holland these have been doubled.

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# FARMSTOCK

WEST AFRICAN FARMERS' &  
COOPERATIVES' MONTHLY

JUNE 75

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Managing Editor ABIQDUN OJUGBELE

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# LETTERS

## ROADS TO FARMS

The roads leading to important agricultural sites in various parts of the federation have become so bad that farmers find it very difficult to transport their products to the markets.

It appears that the authorities cannot cope with all the road developments in the country particularly roads leading to farms

Moreover, I am appealing to the government to improve some of these roads before the next rainy season.

CALABAR

PIUS EFFIONG

## MANPOWER AND AGRICULTURE

The use of manpower in agriculture is among the main causes of poor agricultural outputs in the country. Superstition also contributes a lot to poor agricultural output as farmers maintain beliefs of irrelevant ideas.

Government should consider granting loans to farmers to buy modern implements. Such implements will reduce their task, do their chores efficiently and quickly so that more produce will come from the farms. Surely life will be easy for all and food will be cheap.

LAGOS

BABA ADE

## ESTABLISH TRAINING CENTRES

Illiteracy among farmers is rampant mainly because farmers from time immemorial do not believe in writing, learning or reading. This point made many farmers to remain illiterate today.

To boost agriculture in all aspects, illiteracy needs to be terminated. How can this be done as some farmers are already old enough to forget about learning, reading and writing? To me, I think illiteracy

can be curbed if training centres are built for the training of our good old farmers by agricultural experts throughout the country.

If this is done with an immediate effect, Nigeria by 1978 will be better for it.

OSHOGBO.

AYODELE BALOGUN.

## FARMER'S GUIDE

Farmers throughout the country ignore essential points necessary for good results in grain storage.

Many farmers do not clean their store rooms and thereby allowing insect pests to hide all about in their stores. Additionally, they forget to harvest grains promptly when matured to minimise field attacks by plant pests.

I hope Farmstock can help the farmers by providing them with a farmer's guide in its next monthly.

ONITSHA

ERNEST OBI

## PRICE CONTROL BOARD

Food prices in Nigeria may never fall down if direct measures are not taken in the formation of an effective price control board.

Commissioners of Agriculture should help the nation in solving this drastic position of high prices of essential commodities.

I also suggest that an agricultural price control board be established with inspectors who can move into markets in rushing hours to arrest any person who may charge more than stipulated prices.

WARRI.

AUGUSTIN OSAGIE

## CONGRATULATIONS

I feel happy to congratulate the 'Farmstock' and its entire staff for the useful and important ideas I was able to absorb from its last monthly.

As a farmer and an agricultural teacher I think I can never forget the "Farmstock" Monthly Magazine as a source for useful and important hints on agriculture.

As such I appeal to everyone on the side of agriculture to join me in congratulating the 'FARMSTOCK'!

IGBARIAM.

PETER ZACCHEUS.

## AVOID BURNING IN FARMS

Burning of grasses and trees in a bid to clear the farm up is very dangerous as this could cause much harm to the soil.

The cause of these burnings proves that farmers do not want to exhaust the energy they would use in making the farms, in cutting down the grasses and trees.

Furthermore, the use of fertilisers should be encouraged.

IBADAN.

ISHOLA OWOSENI.

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## OPINION

# School Farm

A recent report disclosed that a general world food shortage existed. The report also localised some danger spots, the causes of such setbacks in the production of food but it also suggested remedies.

On the West African Coast is Nigeria also

On the West African Coast is Nigeria also plagued like her neighbours by shortage of food. Though teaming with about sixty million three quarters of the population are under fifteen. This big chunk of the population though feeding like maggots cannot produce anything. To grow well they just need all the nutrients the nation can give them.

Even in the remaining quarter of the population are old people, infirm and aloof to worldly worries, hence equally unproductive. This batch constitutes about an eighth of the population. Briefly, in Nigeria our model country, one-eighth is feeding seven-eighths of the population. Any one can see why a general food shortage exists. The same conditions apply in many places.

Of the many remedies suggested one is the involvement of our school population in Agriculture. They can be trained and will eventually become farmers or breeders as opposed to oldies who are on their exist and so can be excused from the whole task.

The prosecution of the programme involving school children demands compulsion. Unless agriculture is certified a compulsory subject

some parents may support their wards who may refuse to study and practice farming. Such erring parents may think that agriculture will distract their childrens' attention from the Arts or Sciences for which their chaps are being groomed unmindful of the fact that the various disciplines are interwoven; thus to be successful in one calls for an inkling of the knowledge of the others.

Besides, since mechanisation is the answer to modern agriculture, farming therefore does not mean everyone going to till. The scientist has his part to play; so is the engineer and the financier. Only an early brush with agriculture can attune such minds to see what contribution to make to the industry in later life.

Quite surprisingly, many are unaware of the various departments of Agriculture. Therefore to attune young minds, supported by their parents, to the industry calls for much publicity not only on the grounds covered but also on the chances of becoming wealthy through agriculture since many view success in life not in terms of service but acquisition.

The Ghana experiment will continue to be a pilot scheme for many African countries and may be some countries will outshine Ghana eventually when the scheme is fully understood but as of now Ghana youths are in the frontline. That is as it should be; all those who want to eat ought to do something to help in the production of food.

From the Economic point of view:

# AGRICULTURE West

I shall discuss this topic on the problems of West African farmers, the consequent causes of low agricultural productivity and their effort to modernise agriculture.

I shall then try to emphasize why agriculture is of paramount importance to the growth of the West African economy and offer suggestions as to how the level of agricultural productivity should be raised.

A large number of West African farmers still rely very heavily on the traditional methods of farming such as shifting cultivation and bush fallowing which leave sizeable portions of cultivable lands "idle" for upwards of 3-5 years after being previously farmed for an equal number of years. During this period of "idleness", such lands - almost amount to 40% of the total arable lands in some areas - yield nothing.

Besides, a lot of general labour as well as crude implements like traditional hoes, diggers, cutlasses are still being freely and widely used. The use of these consumes a lot of human energy and lowers the amount of work an average farmer can do daily. In some areas, such natural phenomena like flood, soil erosion, drought and unfavourable soil conditions conspire to make it impossible for modern implements to be applied.

In some areas, sophisticated farming machines are imported and later, it is discovered to the chagrin and woes of the people that many such machines are not tropicalised and when they get spoilt, hardly could their spare parts be found locally and where found, there are few technical experts to service such machines. These machines often break down and give rise to low productivity.

In the savannah regions (grassy areas), fire is usually set on the land for clearance. In the forest areas, trees are usually cut down and burnt. This process of burning often reduces the fertility of the soil. Very few farmers respond to the various government campaigns for the introduction of fertilizers and the application of insecticides on their farms.

A large majority of the farmers are uneducated and their activities are not properly organised. Even their costs of production are hardly related to their output. Ignorance and wholesale beliefs in superstition explain why many West African farmers attribute poor harvests and bad climates to supernatural causes and at times await the dictation of the local gods before harvesting certain crops.

## COMMUNAL LAWS

The farmers' belief in the gods is so strong that large acres of useful lands are specially reserved for their dead ancestors as shrines or for the burial of local dignitaries. The land tenure system in West Africa is very complicated. Hardly are there genuine titles over certain lands especially in the rural areas. Most lands are communally owned but controlled by the village chief or family heads even though every adult has a right to use part of such lands.

This means that no portion of such lands could be pledged as securities for loans. This constitutes a serious handicap since such loans are so badly needed and would have gone a long way to enable farms acquire modern agricultural implements, fertilizers, insecticides and improve seedlings. Besides, most lands are fragmented (broken) and each portion is separated by fences erected here and there.

The market for the disposal of large farm produce is limited. Moreover, there is poor transport and communications system. Many roads are not well constructed, some areas have only bush paths while some are not easily accessible.

These limitations hinder the free flow of agricultural products to these areas and together with the limited earnings of the majority of the people, constitute a discouragement to greater output.

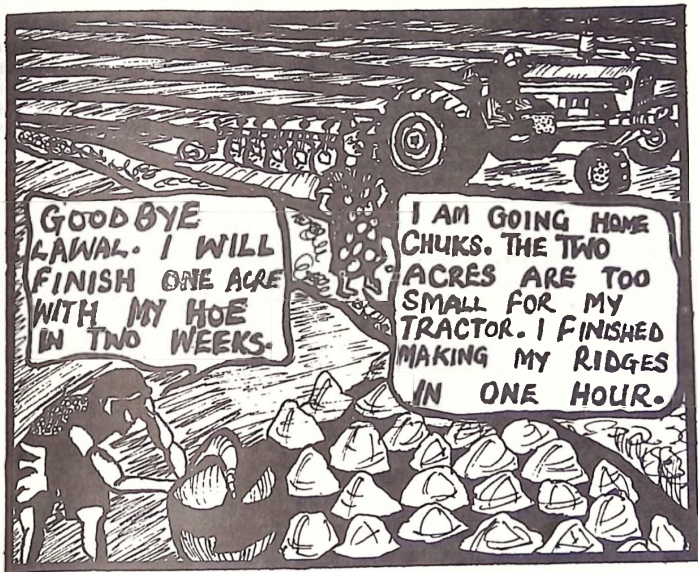
Conscious of the importance of agriculture to the economic development of their countries, the governments of West African countries have been trying from time to time to embark on certain bold steps to modernise

and improve the volume and quality of agricultural output in their countries. Many of them established PLANTATION FARMING. GUINEA established the banana plantation.

IVORY COAST had coffee, cocoa and rubber plantations whilst in the FARMSTOCK

# URE in Africa

by Fidelis O. Akpom  
B.A. (Econs.) Durham  
Dip. Ed. (Lagos)



CAMEROONS, there are oil palm plantations – even though most of them are foreign owned. In GHANA, State Farms have been set up. For instance, in 1965, state farms in Ghana occupied 66.4% of the total 960,784 acres of land under cultivation. They also owned oil palm plantations, irrigated rice farms and different kinds of plantations for mixed farming.

In NIGERIA, the FARM SETTLEMENT SCHEME was established. Carefully planned and organised farms were introduced for young and educated farmers who were exposed later to expert advice and credit facilities from the government. The potential farm settlers were properly trained in the various farm INSTITUTES established.

Later, these settlers with their families were offered sizeable farm-lands – depending of course on whether such lands were for poultry, animal husbandry or for cash and food crops. Right now every state government in Nigeria has allocated considerable sums of money in their respective budgets towards improving the lot of the farmers and raising the level of agricultural productivity in the country. The overall aim is to prove that farming can be profitable and can effectively provide an adequate means of livelihood for all and sundry.

In LIBERIA, the American Fire-Stone Company realising the importance of rubber growth and development, pumped in a lot of money into the establishment of RUBBER PLANTATIONS. Improved modern and scientific methods of farming were introduced to raise the quantity and quality of rubber products in the country and then compete favourably in the world commodity markets.

Despite the obvious good intentions of these governments, the Farm Plantations, Farm Settlements and the State Farms encounter series of obstacles. Stated briefly, these include:

- (a) the costs of financing these projects have been too prohibitive.
- (b) the local people are often very unwilling to offer lands to the governments and as

such, some governments have to resort to compulsory acquisition of their lands — subject of course to either adequate compensations or where they disagree, court actions. In either instance it is a protracted affair leaving the parties worse off and causing unnecessary split in families.

- (c) The non-co-operative and apparent exhibition of disinterestedness on the part of the local farmers have even stultified the government's efforts and frustrated and realisation of the hope that the scheme would be successful.

Nevertheless the Operation-Feed-Yourself-Programme which has just gathered its first harvest is the boldest agricultural venture undertaken along West Africa. The bumper harvest — (Farmstock November 1974) cleverly shows the village farmer what discipline and machines working together can achieve within a short period.

## ECONOMIC IMPORTANCE

Agriculture is the mainstay of the West African economy. It is the largest contributor to the gross domestic products of these countries. It is the dominant source of foreign exchange earnings. It supplies between 75% — 80% of West African exports and the foreign exchange earnings realised help them to pay for the agricultural equipments (machines, tractors etc.) that help to modernise and expand industries, infrastructures and agriculture itself.

The majority of the capital projects carried out by these countries for sometime now are financed from reserves accumulated by the Marketing Boards from time to time from the total earnings of farm produce.

It is the largest employer of labour. Since West African economy is highly dependent on primary production, agriculture absorbs more than 70% of the entire working population.

It is also the source of domestic food staples both for the expanding industrial and urban population. Food crops like yams, cocoyams, beans, rice, cassava, groundnuts, maize, millet etc., are now made available

to satisfy the local food requirements.

It is the source of capital for the newly established industries in the country. It is the source from which labour is later released for work in the industries.

Agriculture supplies the old and new industries with the essential raw materials for production e.g. cotton for the textile industries; rubber and leather for the show factories; tobacco

leather for the show factories; tobacco for the cigarette industries etc. It also helps to relieve many local industries from relying helplessly on

industries from relying helplessly on the ever fluctuating world market prices for these commodities.

It also constitutes a potential market for the products of these new expanding industries — hoes, fertilizers, insecticides etc., produced in the industries are purchased for use in agriculture.

Taxes on agriculture, export crops and on the imports brought with the foreign exchange proceeds constitute the main source for public investment in many social, physical and economic infrastructures such as schools, hospitals, transport and communications, etc.

## SUGGESTIONS

Apart from the current plans now being adopted for the promotion and improvement of agriculture by the various governments some helpful hints may still be welcome namely:

- (a) the use of labour-saving machines
- (b) the application of manures, fertilizers and the other soil enriching materials to improve the fertility of the arable lands
- (c) how to be less superstitious.

These could be achieved through

- (a) public lectures in the local language by experts on the subjects.
- (b) through mobile cinema shows and also

- (c) through exhibitions and open air demonstrations on the use of these implements and equipment.

Young school leavers should be induced and encouraged to take to agriculture. This could be done by making the condition of living in the rural areas very attractive.

The governments should liberalise credit facilities for farmers and grant them loans without demanding unreasonable securities. Credit banks should offer short-term loans to these farmers. Farmers should be made to buy improved seedlings and farm equipment etc., at subsidised prices

The governments should endeavour to diversify their economies through the establishment of more industries that would consume considerable percentage of the farm products instead of relying mainly as they do now on the export of few cash crops whose prices are ever fluctuating.

More markets, especially in Eastern Europe should be explored while at the same time, the link with the traditional consumers in the U.S.A. and Western Europe should be further strengthened.

Ghana is to hold its third International Trade Fair in Accra from February 15, 1976. From then, the Fair will be held every two years instead of once in four years.

A special committee comprising 15 members has been set up to organise the fair:

Lt.-Col. (Alhaji) D. A. Iddisah, Commissioner for Trade and Tourism and chairman of the committee, said the character of the third International Trade Fair would be different from those of the two previous ones.

The Commissioner told a press conference at the Ambassador Hotel in Accra that emphasis would be placed on agricultural machinery and implements, fertilizer plants and storage.

"The main theme of the fair is 'Machines and Implements for Food Production'."

The third fair, the Commissioner said, would inaugurate a regular international event in the country.

"We are inviting all manufacturers to assemble their latest machines and gadgets which will help to feed the millions who desperately need food", Lt.-Col. Iddisah said.

"We invite them to bring not only their fertilizers, but also their fertilizer plants, especially those which can be assembled easily and cheaply and worked with ease in developing countries".

Lt.-Col. Iddisah touched on storage of agricultural products which he described as a great problem in many countries, including Ghana.

That was why, he added, the Government had invited scientists, industrialists, manufacturers and traders all over the world to exhibit those of their products which might help tropical and developing countries in general to solve the problem of food storage and supply.

The Government had also invited all developing countries, especially African countries, to come and see what is available in the field of agricultural implements, fertilizers and storage plants", he said.

The Commissioner said the Government would do all it could to make the stay of exhibitors and visitors as pleasant as possible.

## FAIR



He expressed the hope that Ghanaian manufacturers would "try to show our visitors what they have done and are doing to support the policy of self-reliance and especially 'Operation Feed Yourself'".

Lt.-Col. Iddisah said the third fair would provide a unique opportunity to sell and buy vital machinery and plants which are needed "if we are to feed ourselves on our small evershrinking planet".

## CHURCH ON AGRICULTURAL CRUSADE

The Hierarchy of the Church of Pentecost of Ghana have urged religious institutions in Africa to mobilise the youth for an agricultural crusade to free the continent from hunger and want. For too long, they said, Africa had relied on outside help to feed its growing population, adding "let us accept the clarion call of Ghana's National Redemption Council (NRC) to grow more food to feed ourselves and our former benefactors".

Opening a four-day annual convention of the church being attended by more than 7,000 members from Ghana, Dahomey, Ivory Coast and Togo, recently the Reverend T.A. Nartey noted that if the continent's vast stretches of land now lying waste were fully utilised, there would be abundant supply of food for all".

## AGRICULTURE, ITS ROLE IN GHANA

Agriculture contributes 42 per cent of the country's gross domestic product and employs about 60 per cent of the country's working population. But the renewed emphasis given to the strategic role of agriculture in the national development in recent times is never in doubt.

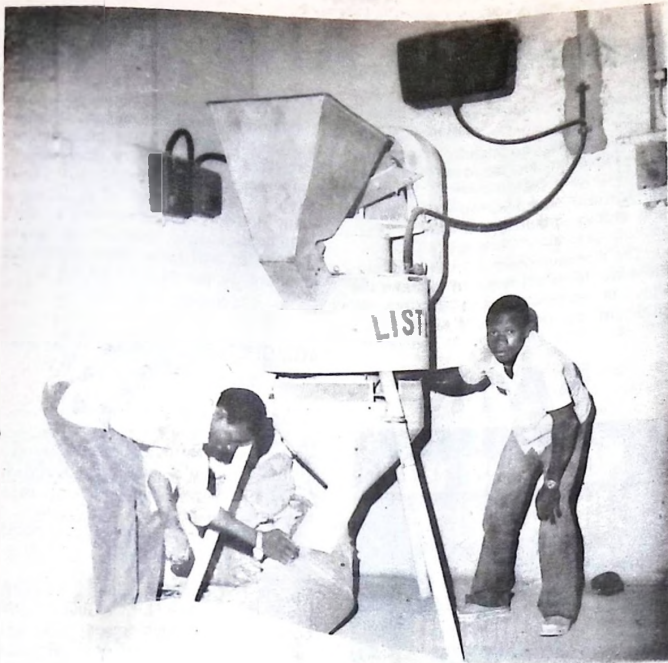
The "Operation Feed Yourself" programme is the N.R.C. Government's policy of rapid development of agriculture for self-sufficiency in food, livestock and industrial raw materials to feed existing factories and for export.

The N.R.C. Government's agricultural programme has taken some definite strides. Agriculture today is no longer considered by Ghanaians as the preserve of those without formal school education. People of all levels of the social strata are actively taking to agriculture.

Already, millions of acres of land have been brought under maize, rice, millet, cassava, yam and vegetable cultivation. In 1972 alone over five million acres of land were cultivated and in 1973 combine harvesters had to be brought into the country to facilitate the harvesting of cereals.

Northern Ghana according to the 1974-75 budget proposals is today being turned into the nation's granary. In a recent interview, Colonel Bernasko, Commissioner for Agriculture had this to say: "We have 92,000 bags of rice stored away and we intend to carry on with this pattern every year".

*please continue overleaf*



*Electricity plays a very important role in the life of a modern farmer be he a crop or livestock keeper. In picture above, animal and poultry feed is mechanically produced at the Government Farm Centre, Agege.*

There is, however, still more to do in respect of making this country economically self-sufficient. One unfortunate aspect of this country's agriculture is that its massive support of the economy can be attributed to only one crop - cocoa. Cocoa alone cannot sustain the economy at all times so that it is necessary to seriously start diversifying the economy by growing other exportable crops.

There are also problems with the supply of machinery, seed fertilizers and insecticides to the farming population. Storage, transportation and marketing facilities have been inadequate and inefficient. The land tenure system has still not been properly put in the right perspective, hence prospective large farmers have had to contend with cumbersome procedures of acquisition of large tracts for their operations. It is no wonder therefore, that the country still continues to spend a sizeable portion of its hard earned foreign exchange on food imports.

It is hoped that with the launching of the third phase of the "Operation Feed Yourself" programme a long way would be reached in the country's search for a meaningful self-sufficiency in the economy. Greater emphasis ought to be laid on the marketing and storage systems so as to ensure efficient supply of food items on the markets.

In this regard the First National Agricultural Fair should be viewed in very important perspectives. All important agricultural requirements of the country can be effectively emphasised at the fair so that every achievement made whatever is still in the process, and the projections for the future would be seriously reflected.

### GHANAIAN FIRMS MAY JOIN IN KAISER RICE PROJECT

The Government of Ghana and a number of Ghanaian financial institutions may participate in the Accra

Plains rice project. A Statement issued in Accra by Mr. J.V.L. Phillips, resident manager of the Volta Aluminium Company, said the VALCO has had discussions with the National Investment Bank, the Agricultural Development Bank and the Standard Bank of Ghana which had expressed an interest in participating in the project.

Kaiser Aluminium have now entered into an agreement with Hawaiian agronomists to conduct a feasibility study and prepare a report on the development of a commercial rice project of 5,000 to 10,000 acres, the statement said, adding: If the feasibility study establishes the commercial desirability of a large-scale

rice project in the Accra Plains and the Government concurs in this conclusion, Kaiser Aluminium, in conjunction with the Government, its institutions and the technical partner, would hope to establish such a project.

Expressing the belief that the project would be fully consistent with the N.R.C.'s programme of achieving self-sufficiency in agriculture, the statement said if it "becomes successful and profitable", it would also serve to stimulate other agricultural projects in the area by Ghanaian and other investors.

The statement recalled that after a series of negotiations between the Government and Kaiser Aluminium, its engineers arrived in the country in August, last year, to conduct a survey and make recommendations on the project.

### ANIMAL FEEDS

The East Central State Agricultural Department Authority for livestock projects at Nekede and Ninth-mile Corner, near Enugu will produce 24,000 tons of animal feeds annually when in full operation.

This was disclosed recently by the Manager of the livestock project at the Ninth mile Corner, Mr. C.I. Iheanacho

## YAMS DONATION

The Enugu Yam Sellers Association recently donated about 300 yam tubers to the Enugu Social Welfare Council in response to the council's call on the public spirited organisations and individuals for financial and moral support to the council.

The Enugu Social Welfare Council is humanitarian organisation which caters for the less fortunate citizens.

The Principal Welfare Officer of the Enugu Social Welfare Council Mrs. Pauline Ojike expressed the need for agriculture and urged the Yam Sellers Association to encourage it's farming sector in abundant production of foodstuff.

## BUMPER HARVEST

There have been bumper harvests of food crops from state owned farms in the North Western State, a Government Spokesman disclosed.

Stating further the spokesman said that in places like Sokoto, surplus crops of millet, rice and maize will be stored under the Governments grain reserve programme.

## 54m NAIRA FOR AGRICULTURE

Nigeria has received from the World Bank a loan of 54 million Naira for rural agriculture development.

This was announced recently in Lagos by the Cabinet Office.

It said that the loan represented 50 per cent of the estimated costs of rice project in the East Central and South-Eastern States and rural agricultural schemes in the North Central, North Eastern and North Western States.

## TECHNICAL ASSISTANCE FOR LIBERIA

President Tolbert of Liberia said that he saw trade possibilities in rubber sales to, and purchase of sugar and rice from, Guyana; but the major problems would be transport.

He also raised the question of Guyanese technical assistance for Liberia, particularly in agriculture.

Speaking further, Mr. A.C. Jackson,

Junior Registrar of the Episcopal High School, expressed dissatisfaction about the Educational Policy of Firestone Plantations.

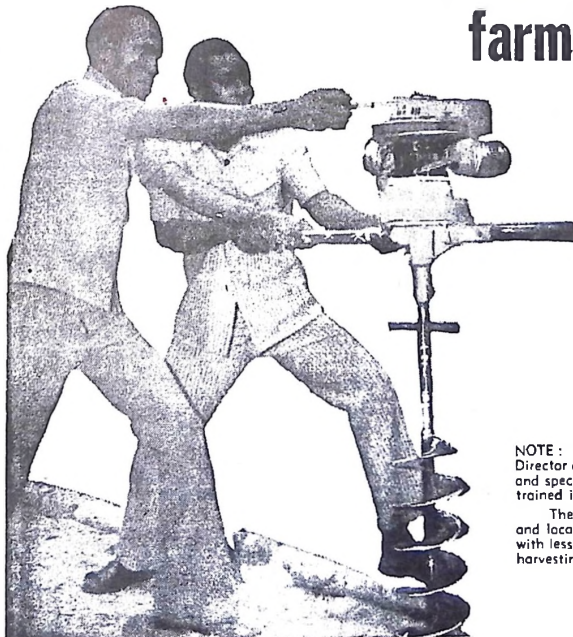
He said Firestone, the oldest foreign company in Liberia exporting huge quantities of best grade rubber had not provided a single high school, since it began operations in 1926.

## SUPPLIES TO FARMERS

Farmers in Kwara State are to be supplied with fertilizers, insecticide and tractors for hire at moderate charges. They would also benefit from irrigation, soil reservation, fisheries project and granaries.

This was announced by the Publications Department of the Ministry of Home Affairs and Information, Ilorin.

At present, according to the report, a sum of 610,000 Naira had been spent on the expansion and improvement of two agricultural Training Centres in Osaro and Ilorin, and the establishment of a farm centre in each of the eleven administrative divisions of the state.



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## FARMERS GET GOVERNMENT SUBSIDIES

The East Central State Department of Agricultural Extension has presented large quantities of various food commodities to 49 progressive farmers in Arochuku division. This is as a result of the world food programme "project 775" now being implemented throughout the state.

Project 775 is a world food programme whereby tree-crop farmers, mainly oil palm, rubber and cocoa farmers who have established new plots of tree-crops since 1970 are given encouragement to enable them maintain their plantations up to good standard.

## MECHANISED AGRICULTURE

Farmers cannot derive full benefits from the agricultural programmes prepared for them unless there is a dynamic knowledgeable and efficient extension service, the Military Governor of South Eastern State, Brigadier U. J. Esuene has said in Obubra.

It was with this understanding, Brigadier Esuene pointed out, that the State Government made consistent efforts to train junior and middle-level technical manpower in the five schools of agriculture in the country and later decided to establish a multi-discipline school of agriculture in Obubra.

Esuene was delivering a lecture at the graduation ceremony of the pioneer students of the School of Agriculture at Iyamitet in Obubra division recently.

## N27,000 SET ASIDE

The Area Development Board in Sokoto has set aside N27,000 for the improvement of general environmental sanitation in the township. Chairman of the Board, Alhaji Abdulkadir Abubakar J. Kalgo said, of the amount, N25,000 had been spent in the exercise.

The Chairman said his Board, in collaboration with the Local Authority and the State's Ministry of Health staff was trying to educate house owners to construct socket pits in their respective houses to the public drainage.

## NEW FARMERS TO GAIN

The North Western State Government has reached an agreement with the Nigerian Agricultural Bank (NAB) to grant a loan of 4.5 million Naira for the establishment of a loan scheme for farmers in the State.

Announcing this recently in Sokoto, the States Commissioner for Agriculture and Economic Planning, Alhaji Ibrahim Tako Galadima said the agreement on the loan would soon be signed.

## GARI INDUSTRY

The foundation stone of a 6,000 Naira gari industry has been laid at Omega Achara, in Ezzikwo Division, East Central State.

The ceremony was performed by the senior Co-operative officer for Ezzikwo, Mr. D.M. Chuku Nwosu on behalf of the registrar of Co-operatives at Omega Achara Ikwo.

Nwosu described the industry as an important milestone of the economic and social development in Ezzikwo.

The Industry is expected to give employment to more than 50 workers.

## FOOD CRISIS AHEAD

The Food situations in Nigeria is going to get worse before it gets better.

The report is alive with alarming facts and figures pointing to many years of hardship for Nigerians.

The basic fact is that the gap between food production and food needs is growing rather than diminishing.

The basic cause of this is that the rural population which provides the food, is growing less slowly than the urban population. An additional factor is that about half the population of independent Nigeria is under the age of fifteen, meaning that it needs to eat well, but plays no part in food production.

Some months ago tubers of yams were donated by the Mid-West government to drought victims in the North Central State to avoid massive hunger.

Government and the people must invest more in agriculture to avoid food shortage.

## GHANA APPLIES FOR AID

The Chief Executive of Ghana Cocoa Market has appealed for N5 million from the World Bank for Ghana's Cocoa Industry's development Limited, Col. Kwatu and Takyi (Chief executive) made the appeal during a meeting with the World Bank representatives and Cocoa Association of London. From a peak of 557,000 tons in 1964-65 representing 38% of world production, Ghana declined to 400,000 tons in 1973-74 representing 30% of world production.

These were caused by the age of the cocoa trees and the death of some of the farmers. A number of spraying machines, chemicals and matchets have been provided for farms to boost production.

## LOAN FOR RICE

The Bank of Ghana will guarantee loans from the Commercial Banks to the rice mills for the purchase of rice during the current harvest season.

Mr. C. T. Nelson, Executive Director of the mills, has said that negotiations to this effect has been completed that the loan, based on a system called "Special Credit facility for agricultural produce marketing" will be a revolving fund to be refundable when the cheques matures after 80 days as in the case of cocoa.

## AID FOR SIERRA LEONE

Dr. Waldhein, UN Secretary General, has authorised disbursement equivalent to 750,000 Naira from the UN Special Account for the Emergency Operation (UNEO) to Sierra Leone in continuation of the UN's effort to aid countries most severely affected by the prevailing economic crisis.

In a message to recipient governments, the Secretary - General has suggested that the funds will be used for buying fertilizers.

*continue on p.15*

# New weapon in the war against Insects

by Arthur Motte  
a London journalist



Insects eat about one third of all the world's food production before hungry people have a chance to get at it. In the developing countries much more food is lost in this way — and some of the insects kill millions of people every year by spreading diseases like malaria.

It is not surprising that the insect is one of the principal targets for the scientist; without his pesticides no amount of fertiliser would be able to make up the losses in food crops.

Twenty years ago it was thought that heavy applications of synthetic chemicals would solve the problem. But insects developed a resistance to them, and the chemicals steadily polluted the environment.

## Call For New Control

There was an urgent call for a new pest control which would protect the growing plant and also its crops when they reached the food storehouses of the world, without making them harmful to man and his environment.

To find it, scientists at the oldest plant research station in the world at Rothamsted, near London, turned to one of the longest known natural insect killers in the world — pyrethrum

This is found in the flowers of the pyrethrum plant, which grows in Kenya and other parts of Africa.

They triumphed with a new pesticide — a synthetic chemical known as

NRDC 143 — which does not pollute the environment. NRDC 143 kills off insects that have become resistant to existing pesticides and is many times more potent than products already discovered.

Earlier synthetic pyrethrins break down very quickly when exposed to the air and sunlight and, although this makes them non-polluting, it limits their use to indoor pest control.

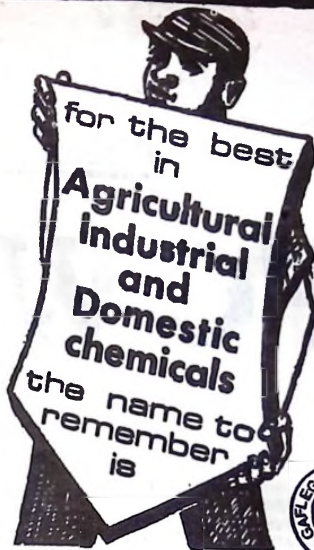
## Effective - And Cheaper

NRDC 143 remains active for about three times as long as natural or earlier synthetic pyrethrins, is cheaper to produce, and is highly effective on a wide variety of insects, among them the Army worm, white fly, aphids and

grain beetles. It kills only insects and is said to be completely harmless to human beings and all forms of livestock.

This means it will be of great value in protecting stored crops without frequent application. It is difficult to protect stored crops with present insecticides because of the risk of harmful substances getting into the food.

There will be plenty of room in the world for both NRDC 143 and natural pyrethrin. Kenya is growing new plants with higher insecticidal content and other advantages. Vast quantities of both are needed to conserve the world's food supplies. ■



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## Diseases of poultry

# FOWL POX

by Our Livestock Correspondent

FOWL POX IS A VIRUS DISEASE OF POULTRY, WHICH MAINLY AFFECTS CHICKENS, BUT CAN ALSO OCCUR IN TURKEYS, PIGEONS, GUINEA FOWL, AND QUAIL. DUCKS AND GEESSE ARE NOT AFFECTED. NEITHER ARE HUMAN NOR ANIMAL. IT IS ONE OF THE OLDEST KNOWN DISEASE AND CAUSES LOSSES IN MOST COUNTRIES.

The most typical symptoms are pox marks on the comb and wattles. These marks start as small grey-white spots, which grow rapidly, and turn yellow. There may be few or many. In severe cases the bird's head may be covered in rough, wartlike growths, which may also be found under the wings, round the vent, or on the legs and feet.

In time the pox marks dry into brown scabs surrounded by red inflamed areas. After a few weeks the scabs drop off, leaving a smooth scar, unless bacteria have entered the site, when the whole is more severe.

### AREAS OF INFECTION

In some birds the virus grows in the cells lining the mouth and throat, causing yellow-white nodules which grow rapidly, and may become thick enough to interfere with eating. Similar growths may come in the sinuses, and interfere with breathing, or in the eyes.

The effect of growth and production depends on the extent of the disease in each bird. In some flocks the disease spreads rapidly, and in others quite slowly. Wounds caused by sharp pieces on the cages or equipment may increase the spread of the disease.

### DIAGNOSIS AND PREVENTION

Diagnosis can usually be made by inspection of the birds. Laboratory methods can be used if there is doubt, and include the examination of thin slices of the comb to look for "inclusion bodies" which are typical of fowl pox.

Another method is to apply diseased material to the comb of a susceptible bird to see if it gets the typical pox.

There is no cure for Fowl Pox. Good husbandry will generally reduce the effects of the disease, otherwise it must run its course.

Prevention is by vaccination. A live virus vaccine is used, and is applied to the wing web by jabbing it with a two pronged needle which has been dipped in suspension of the virus.

Because the virus is applied by such an unnatural route as the wing web it does not produce the disease, but does produce an immunity, which should last for the life of the bird.

### WHEN TO VACCINATE

The vaccination is best made between six and twelve weeks for best results. If it is used before six weeks the birds immunological system is not fully developed, and so the immunity produced is weaker.

By twelve weeks the birds ought to be protected. However these are not rigid limits. For example the vet may advise vaccination earlier than six weeks if he considers the risk of early infection great.

Again the time may be planned to fit in with other vaccination.

Fowl Pox virus is exceptionally long lived outside the bird. A survival period of twelve months has been quoted in some conditions. There are related Pox viruses, which take their name from the bird most commonly affected by them: Fowl Pox, Turkey, Pigeon Pox and Canary Pox.

Each virus can infect each species of bird, but more mildly than its own kind. An attack of one virus will give the bird partial immunity against attack by the other kinds.

## West to aid Farmers

Several agricultural projects, designed to meet high cost of living in the Western State, have been embarked upon by the state's Ministry of Agriculture and Natural Resources.

The projects will serve as an impetus to farmers in the efficient production of food in adequate quality and quantity for the state.

This was made known recently by the state's commissioner of Agriculture and Natural Resources Dr. Gbolahan Ashiru at Shagamu while performing the official opening of the sixth Abeokuta/Ijebu Circle Agricultural Show.

In addition, he pointed out that 354 acres of rice and 230 acres of Western yellow maize as well as 469 acres of cassava had also been planted to ensure that farmers had

the same quantity of these crops in the next planting season.

To assist farmers to accelerate more food production, he said loans totalling N16,000 has been made available to farmers in the circle through the Agricultural Credit Corporation (ACC).

### RISE IN COCOA IN GHANA

Cocoa values have risen sharply and the London terminal market Dealers were at a loss to identify the precise reasons for the rise in cocoa. The USAID'S Foreign Agriculture Service put World Cocoa Bean Production in 1974-75 at 1.45m tons up by 1 per cent over 1973-74. It said the improved weather conditions will boost African production.

### HAWAIIAN AGRONOMISTS IN GHANA

A Team of rice experts, agricultural and irrigation engineers will arrive in Ghana very soon to prepare

plans of large scale agricultural development - in the Accra plains.

The team, from Hawaiian Agronomics Company an international agribusiness, engineering and management consulting firm, will undertake the project in partnership with Kaiser Aluminium and Chemical Corporation.

This was disclosed by Mr. Wayne Richardson, President of Hawaiian Agronomics. He disclosed that between 5,000 and 10,000 cultivated acres would be agriculturally and economically feasible

He said they believed that this project would further Ghana's "Operations Feed Yourself" programme by meeting basic food need, producing a viable new commodity entity and reducing the over-flow of foreign exchange for a commodity which they felt could be economically grown.

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bricklayer and carpenter. Besides, on the virgin tracts I receive an excellent idea of life replete with friendship, camaraderie, internationalism. I am glad I'm going back home not only as an economist, but also as a builder."

"For a specialist it is very important to know what common labour is like, to get the feel of it," wrote Joseph from Nigeria. Only he who works, lives a full

life. For the youth the construction site is a school of life. "It's a tradition for our international 'youth of the planet' team to spend each summer to the virgin lands," wrote Edmund M'Boulou Monso of Zaire an undergraduate of the Department of economics and law, who has been to the virgin lands five times.

### LASTING FRIENDSHIP

"In 1973 our team again won the first place among those working in the district. That is also a pleasant tradition. "After

working hours, we often got together with the local population," wrote Edmond. "Our boys delivered lectures about their countries, and gave concerts of African music and dances. The residents of Shortanda are hospitable and pleasant people. We felt their warm concern for us from the very

## on the virgin tracts

By N. Sologubovsky

first day of our arrival there. We became friends.

"Our work in the virgin land teams benefited us African students and helped us better to understand the life of the Soviet people. It strengthened our friendship with the Soviet youth.

Edmond concluded: "I shall always recall the wonderful virgin-land!"

cause, a contribution that shall not be forgotten.

As many as 1,340,000 Soviet people were awarded "for developing the virgin lands" medals for their selfless work. Edmond M'Boulou Monso also received this medal, among other African students, for whom the virgin land proved a second university.

### The Laggardly Limousin

A survey in Britain by the Milk Marketing Board has shown that the average Limousin-sired calf is carried 70 days longer than the Simmental, 73 days longer than the Charolais and five days longer than the Hereford.

significantly inferior to the record when Hereford bulls are used and when less than 1 per cent of the calvings prove to be difficult.

from the Agricultural Research Council.

High yielders show more benefit than low yielders from extra food and so does the cow in early lactation compared to the cow in mid lactation.

Level of yield and hence level of feeding in early lactation sets the pace for the remainder of the lactation.

Therefore the farmer must pay more attention to preparation (steaming up) before calving and to post-partum feeding (challenge of lead feeding) in order to maximise peak yield which is the key issue in the whole food milk problem.

Over the few critical weeks after calving food intake is low. The cow is thrown back on to mobilisation of body reserves to assist reaching her highest peak yield. These body reserves have had to be stored prior to calving.

## agricultural notes

In fact, the Limousin-sired calves are carried longer than any other breed the Board has ever measured.

The calves were born out of Friesian cows, with difficult calvings averaging 2.4 per cent of the total when the sire was a Limousin.

Although better than the Simmental average of 3.5 per cent, it was signi-

### Getting The Feed Yield Equation Right

How much extra milk a cow produces from extra food has been the subject of trials at the National Institute for Research in Dairying at Reading in Berkshire.

"These questions have been answered," says a report on the research

*please continue overleaf*

A concept of feeding covering the lactation cycle as a whole is thus built up particularly when health and fertility are added as further factors dependent on adequate nutrition.

Good quality forages always assist the farmer in reaching his multiple objectives, the report says.

to such an extent that it was no longer always valid to say that maximum yield was commensurate with maximum profit. In other words - the last few pounds of cake might not increase yield enough to pay for them.

Hence the proposition: how much more milk does a cow produce from extra food and how does a "good" cow compare to a "bad" cow in this respect?

### Selenium Vital In Poultry Feed

Although needed in only minute amounts in poultry feed, selenium is nevertheless a very necessary part of the birds' diet, according to Hy-Line International expert Dr. C. Howe.

Selenium, a non-metallic element resembling sulphur, has previously found its way into diets via fish meal - now in seriously short supply.

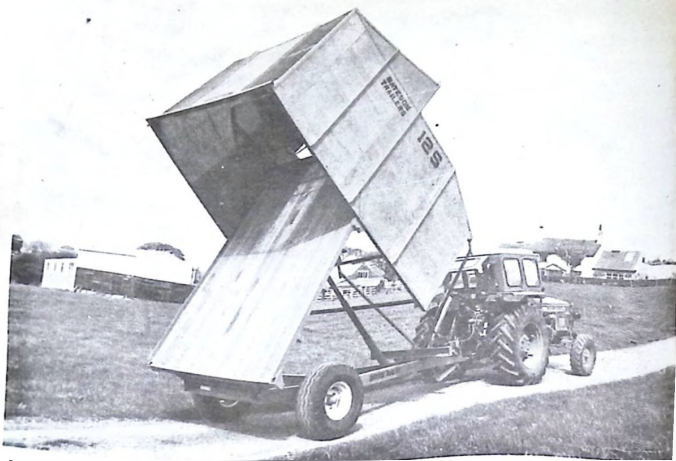
"Although selenium can be poisonous in excess amounts it is very necessary in smaller amounts," said Dr. Howe. It was a vital trace element for many species, including poultry.

Lack of it induced poor growth rates and feathering, and the birds developed fibrotic degeneration of the pancreas, while breeder flocks suffered from reduced hatchability.

Only one gramme of sodium selenite was needed per five tons of feed, according to Dr. Howe, and in countries where its addition to feed was banned, the additive could be given with water at the rate of 50 parts per billion.

### Robot Tractor A Step Nearer

The completely automated tractor is reckoned to be a step nearer following work on a new driverless system being developed by the National Institute of Agricultural Engineering at Silsoe in Bedfordshire.



### NEW SILAGE TRAILER HAS REVOLUTIONARY SAFETY FEATURE

A revolutionary tipping action, incorporating an anti-jack-knife safety feature, is claimed for this new silage trailer which has recently been introduced by a British manufacturer. Known as the "Model S" silage trailer is won the supreme award in the new equipment competition at an International Dairy Show in Britain recently.

A recurrent hazard with conventional trailers is the possibility of the container jack-knifing when tipping a compacted load - this danger being totally eliminated with the Model S. As the floor tips to the rear the silage container, which is anchored to the front chassis, rocks forward on a central pivot allowing the load to discharge freely through the base of the container. At no time during the operation does the centre of gravity pass behind the rear axle, thus eliminating the danger of jack-knifing and allowing tipping to take place close to previous loads or other obstacles.

The Model S, which can be towed by any make of tractor, also features full remote control allowing the farmer to position the trailer and un-load the grass or similar fibrous material without leaving his driving seat. Three versions of the trailer are available; two basic models, the 12S (5 ton capacity) and 14S (10 ton capacity); and the 16S which is a 4-wheel turntable trailer.

Bateson Trailers Limited, Doodfield Works, Windlehurst Roda, Marple, Cheshire, England.

The firm is interested in appointing overseas agents or manufacturing licences.

Still at the beginning of a five-year programme, the system utilises an optical sensor linked to the wheel of the tractor.

The experts in charge, Messrs J.R. Stansfield and G. Harries of the control and instrumentation division, believe that with increasing labour shortages greater reliance will have to be placed on such systems.

The new system follows earlier research with acoustics and a pneumatically-operated furrow wall steering device. And while it is expected to cost more - present estimates put it at well over £1,000 - the fact that it has fewer moving parts makes for simplicity plus the fact that it need not be lifted each time for turning at



## 1974 ROYAL SHOW AWARDS FOR NEW FORESTRY COMMISSION TRACTOR

Two major British awards were made to the Forestry Commission for this new hydrostatic four-wheel drive forest tractor at the 1971 Royal Show at Kenilworth, Warwickshire, in the English Midlands. These are the Burke Perpetual Challenge Trophy for new implements awarded by the Royal Agricultural Society of England, and one of nine silver medals awarded by the Society for entries in the annual Silver Medal Machinery Competition.

The tractor is powered by a Ford 1000 engine and the frame is articulated about a centre pivot. In the front section is the engine, hydraulic pump and the driver; the rear section contains two hydraulic timber winches. The main hydraulic pump provides a stepless variable transmission with reversing and dynamic braking. The timber winches have axial flow motors inside the drums and are controlled either electrically from the cab, or by UHF radio transmitter worn by the driver. Prototype tractors for test work were built in the Forestry Commission workshops and commercial production is being undertaken by a British company.

The three main themes of the 1971 Royal Show were fuel economy crop health and forage conservation. This was the 126th Royal Show and the 12th at the present permanent site. There were 721 trade stands against 678 last year and international interest were reflected by seven overseas pavilions which in the case of Canada and Holland were doubled in size.

FORESTRY COMMISSION, 25, Drumsheugh Gardens, Edinburgh SH3 7RS,

headlands if a suitable device for the latter operation can be incorporated into the equipment.

While designed primarily for ploughing, the equipment will, it is hoped, be further adapted for cultivation and drilling, although for that it must be developed to follow less clearly

defined ground features than those necessary for ploughing only.

At present it consists of a side-mounted projector which casts a 12 in. beam on the ground at 90 deg to the furrow, with tractor and plough lined up when the beam is split equally between the furrow bottom and the unturned soil.

An optical receiver is angled towards the light bands and images produced on photo-detector cells are amplified for transmission to an electric motor which operates the steering wheel.

"Early field trials look promising", Mr. Harries says. "We have worked the machine unattended at up to 3 mph and by modifying the power steering mechanism should make higher speeds possible."

### Specialist Power

#### Vehicle Demand Forecast

While the two-wheel drive tractor will continue to be the main farming tool for some years to come, demand will increase for specialist self-propelled vehicles, predicts Dr. M. Dwyer, head of the tractor department at the National Institute of Agricultural Engineering, Silsoe, Bedfordshire.

For example, the mass-produced tractor working at about 4½ miles per hour on most cultivations tended to become less efficient at converting engine horse-power into draw-bar power as the size of the engine increased.

On heavy land the maximum draw-bar power which can be utilised efficiently is 54 hp while on light land the figure is about 67 hp, corresponding to engine horse-power of 63 hp and 79 hp.

"In both cases reversible ploughs provide better tractive efficiency and on light land they should be semi-mounted to retain adequate steering ability" Dr. Dwyer said.

#### Beef Building Type Not Important

A two-year survey of 589 farms by the Meat and Livestock Commission has found that the type of building used in beef production makes no difference to the performance of the cattle finished intensively.

"Cheap covered yards are as good as expensive purpose-built buildings," said MLC beef specialist Mr. J. E. Sunderland, commenting on the survey at a recent conference held at the National Agricultural Centre, Stoneleigh, Warwickshire.

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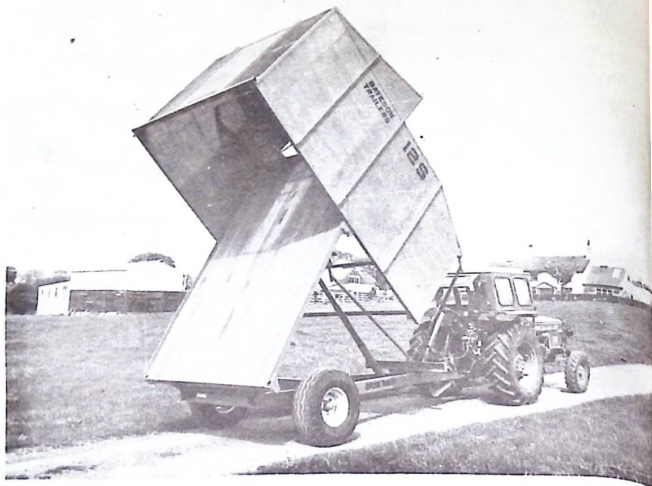
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husbandry in West Africa. Detailed study of the more common diseases of local farm animals, preventive and control measures, in respect at least one of each type of

- (i) Virus-fowl pox, foot and mouth diseases, rinderpest.
- (ii) Bacteria-Anthrax, tuberculosis, contagious abortion.
- (iii) Fungi-Scabbies, ringworm.
- (iv) Protozoa-trypanosomiasis, coccidiosis.
- (v) Metabolic-milk fever, ketosis, rickets, bloat etc.
- (vi) Mycoplasmatles-pleuro-pneumonia.

#### 6. MANAGEMENT OF FARM ANIMALS

Detailed study of management aspects of the following farm animals from birth to maturity:  
 Monogastric e.g. pigs, poultry  
 Ruminant e.g. sheep, goat, cattle.  
 Herbivore e.g. rabbits, guinea-pigs.

A field study of at least one animal from each class is essential.

#### 7. BREEDING AND IMPROVEMENT OF FARM ANIMALS

- (a) Aims.
- (b) Principles of genetics in respect of animal breeding.
- (c) Methods: Selection, inbreeding, crossbreeding and effects. Artificial insemination. Castration.

#### E. AGRICULTURAL ECONOMICS

1. Factors of production-land, labour, capital, entrepreneurship.
2. Law of diminishing returns.
3. Principles of demand and supply.
4. Marketing of agricultural products.
  - (i) Operations-Processing and storage, packaging, transportation and distribution.
  - (ii) The role of the producer, middlemen and the consumer; individuals, co-operatives, corporations, firms, Marketing Boards.
  - (iii) International Trade with respect to agricultural produce.

5. Agricultural Financing-sources and nature of farm credit and financing.

6. Farm Record

Farm diary, input records, production records, farm inventory, farm log-book.

7. Simple Accounting

Preparation of entries of sale and purchases, profit and loss accounts.

#### PRACTICAL EXAMINATION

During the course the candidate is expected to have carried out and participated in practical work on livestock management, farm and vegetable gardening practices. Candidates should also be exposed to the major products of the forest type in their locality.

It is essential that candidates go on field trips to farms in different ecological areas and game reserves within the country.

The Practical Examination will test comprehension, skill observation and recognition.

#### SYLLABUS

##### A. GENERAL AGRICULTURE

Identification, uses, and maintenance of common farm tools, implements and simple farm machines.

##### B. SOIL SCIENCE

1. Identification of common rock types (igneous, metamorphic and sedimentary).
2. Soil profile from practical field work.
3. Laboratory work on physical properties of soil:
  - (a) Mechanical analysis using the hydrometer method and sieves.
  - (b) Determination of particle density and total pore space.
  - (c) Determination of moisture content of a moist soil sample.
  - (d) Determination of maximum water holding capacity.
  - (e) Determination of wilting point to be demonstrated.

4. Laboratory work on chemical properties of soil:

(a) Demonstration of use

- (a) Demonstration of use of pH meter.
- (b) Demonstration of active and reserve acidity using the pH meter, and colorimetrically, using a comparator.
- (c) Evidence of cation exchange by displacement of cations with potassium and precipitation of the displaced calcium with ammonium oxalate.

##### C. CROP SCIENCE

1. Identification of seeds, seedlings, fruits, storage organs and other essential parts of the more common crop plants, local weeds, pasture grasses and legumes.
2. Identification of casual organisms (where possible), nature of damage, prevention and control methods for the common crop pests and diseases.
3. A working knowledge of planting dates, seed rates and plant population, germination testing of the more common local crop and plant population, germination testing of the more common local crop plants is essential.

4. Candidates may be tested in the following skills:

Preparation of seed beds, fertilizer applications, mulching, watering, use of spraying equipment, vegetative propagation, germination testing.

##### D. ANIMAL SCIENCE

1. Identification of the more useful breeds of animal types available in the student's locality. Methods of restraint, handling, and grooving farm animals.
2. Identification of the major internal organs of farm animal (no microscopic studies), e.g. organs of the digestive systems, liver and kidney.
3. Identification of the common ectoparasites (e.g. ticks and lice),

# Agriculture for schools

and endoparasites (e.g. live-fluke, tape worm) of the farm and fish.

4. Recognition of the features of all stages of the life-cycle of pests and diseased condition in animals.

5. Recognition and uses of major animal feeds and feedings stuffs and their local sources.

6. Simple methods of hygienic control, drugging, dipping, spraying and simple medication methods for farm animals.

7. Ability to select

(i) Animals and poultry for breeding;

(ii) Eggs for hatching and to separate good and poor layers, sick and healthy animals.

## E. PROJECT WORK

1. A Farm Project is to be carried out by each student OR a group of not more than four (4) students and a report submitted on it individually during the second term of the year of examination.

2. Field Note Books, Farm Records and account books related to the Project work the candidate has chosen.

### FAMILIES IN OR NEAR THE FARM

Special names are often given to animals and birds to show which is the MOTHER (adult female), FATHER (adult male) and YOUNG (offspring). One member of each family below has been written in for you. Fill in the other family members in this order: 1. Mother; 2. Father; Young. The GEESE are already filled in as an example.

Subtract five points for each one you miss. A perfect score is 100 points, but 75 points is very good.

COW

SHEEP

STAG

CYGNET

FOAL

LAMB

GOOSE

GANDER

GOSLING

NANNY GOAT

DUCKLING

ROOSTER

**ANSWERS:** Doe, stag, fawn, duck, drake, duckling, goose, gander, gosling, pen, cob, cygnet, hen, rooster, chick (or chicken), Nanny goat, Billy goat, kid, ewe, ram, lamb, sow, boar, shoat, mare, stallion, foal, cow, bull, calf.

please continue overleaf →

Note:

The Master for Agriculture using this chart as a guide can draw up similar

exercises. — Editor

# VEGETABLES

Growing of vegetable in the dry season entails much labour but the suffering is nothing when compared with the profit made from the harvest. Why is this so? Does this mean that dry season garden produces more vegetables than the rainy season garden?

The answer is "No." It is an accepted economic fact that "when the demand is higher than the supply, there is a sharp rise in price" and this is truly portrayed in dry season gardening. For the reasons mentioned below, we cannot easily avoid the demand being higher than the supply.

## FACTORS GOVERNING DRY SEASON GARDENING

Certain factors limit the establishment of a dry season garden. Most important among them is lack of adequate water supply. Shortage of water in a vegetable crop will result in a low yield, poor quality of leaves and fruits, even the plant may wither.

This makes it very necessary to acquire a suitable site near a water supply. This may be by a stream, a pond, a well, a river, a dam or even a pipe borne water from where it could be drawn. A second limiting factor is lack of a suitable land close to both a water source and a market or at least a motorable road.

I am confident that all secondary schools in the country have very good roads; so schools may not be perturbed by the second factor: unless your school is far from a water course. A school may be lucky to acquire a garden site near a water course, but the venture may not be a profitable one if the water course is very far from a market or motorable road.

— A Special Correspondent

While making a choice for site, it is very necessary to remember that an extra profit awaits you if your water course is close to a market.

A third factor is limitation of funds because a dry season garden needs more attention than the rainy season garden. This is especially so before December when most people make a final struggle to raise fund for Xmas and New Year celebrations.

## CONTENT

There are several types of vegetables. But in order to succeed, certain conditions must be examined before we make a final selection of the vegetable we plant. Some local vegetables are more in demand than others.

It is not, however, out of place if our choice of vegetables includes the common species of the African Spinach (*Amaranthus*), onions (*Allium Cepa*) Tomato (*Lycopersicum tamuter*), Chillies (*Capsicum annum*), Sun hemp (*Crotolaria junecea*) and Okro, etc.

Where you have a good European population in your vicinity, the inclusion of the following may be very profitable:-  
Cabbage (*Brassica-Oleracea*), Carrot (*Danceos Carota*), Lettuce, Leek, beet root, radish, and so on.

## TIME

The period, October/March is generally dry and it is necessary for us to start our gardening from the onset of the dry season say - 2nd week in October, or a little before after this week. The first cultural operation is clearing, followed immediately by bed-making. The bigger the size of the garden, the earlier one starts work; but a square chain-sized garden is considered fair for a school.

It is even better to be of a commercial scale since if it is well cared for, the proceeds will be fantastic. Some garden plants need nursery attention, e.g. Tomato, lettuce, onion, pepper, etc. while okro does not.

We shall have to transplant those that need nursery attention into nursery beds and sow the others direct into permanent beds. For a little illustration, we shall consider the cultural operations in one of the above mentioned crops - the *Lycopersicum tamuter*.

## TOMATO (LYCOPERSICUM TAMUTER)

Variety: There are many species of tomato. Prominent among them are - the "dwarf gem," the "Za rungu" the "Bony best," the "Pak," the "money maker," the "Valiant" etc.

The difference between a variety and another may be in the size of the plants, the size of the produce, fruits, resistance to diseases

palatability, ability to grow well with very little water, etc.

We learnt from our biology class that trees shed their leaves in the dry season in order to help conserve water which carries its food till the rain comes. We shall, therefore, consider the size of the plant (tree) before making a final choice.

The "Zuarungu" makes a big tree, the same thing with "Valiant" and the "Pak". The "dwarf gem," as the name implies is 'dwarfish' in size with small sized leaves.

Its food consumption rate is considerably lower than the others. It thus, suggests that this variety is ideal for dry season cropping.

## On the air in POLAND

# FARMING BY T.V

— A Foreign Correspondent

The TV Technical Farming School not only helps to increase knowledge on a particular subject, this being true of all TV school programmes, but it is also possible to obtain from it a secondary school certificate which is just as valid as any other secondary farming school certificate. This type of extra-mural tuition is an entirely novel and unique experiment which has emerged so as to meet certain domestic demands.

One of these demands is the giving of good specialized education to people who are to settle down to farming and in future run a farm on their own. And to run a farm involves developing it, rationally making use of all it offers, and also improving and modernizing it. This is why it is so important for farming knowledge to reach the most distant parts of the country.

The students of the Television Technical Farming School number about 15,000 and this figure embraces only those who are formally registered at the local correspondence technical farming schools where they will take all their end-of-term examinations.

The TV Technical Farming School students are mainly young people, round about 25 years old, who seem to have made up their minds about what they really want. And this is the best guarantee of their diligence.

They gather in Young Farmer's, Ruch and other clubs, in schools, and everywhere else where a television set is provided. They also follow

the lectures in their own homes, but this method is considered as a last resort by experienced pedagogues.

Self-education — the basis of the TV experiment — is a difficult skill to master. It can be made more efficient with an exchange of views, discussions, the immediate explanation of doubts, which is possible only in a group. This is why the School founders and organizers continually stress the necessity of forming discussion groups, however small they may be.

The methods of the TV Technical Farming School, the new ways of educating have not yet been fully worked out: it is in practice that new formats will evolve and in the course of time, bring about changes in this unique School. Now a special team is touring the country and making inquiries on the effectiveness of the TV secondary school programmes. Even before they finish their work, one thing can be stated with certainty: systematic work is an indispensable factor guaranteeing success in the TV Technical Farming School.

And this is the reason why the organizers have introduced the so called "guide-notebooks". Every student is provided with such a book, and in it there are blank spaces where homework is to be filled in. These books, properly completed, are one of the conditions for taking each examination. It also allows the teachers to learn something about the student's individual work.

## NURSERY

Make beds of 4' x 25', plant your seeds in rows along the beds — 6" apart from one row to another. Cover with grass and allow 5 days to germinate.

Remove your grass on the 5th day to avoid disfiguring your young seedlings. Water in the morning every other day.

## TRANSPLANTING

After four weeks i.e. when most of your tomato seedlings would have attained the height of 4", prepare your permanent beds 4' x 25'. Manure them properly and transplant, spacing distance - 24" x 12" — i.e. one foot along the rows by 2 feet avenue.

## MULCHING

Mulching is the art of spreading some grass or leaves on top of a bed or ridge as protection for roots of plants. It has two advantages:-

- (1) It conserves water in the soil so that the plants are not parched.
- (2) The mulching material serves as manure when it is completely decomposed. It is thus very essential for us to mulch our permanent bed crops.

## WATERING

When there is no rain there is need to water our bed — using a watering can, 3-4 gallons of water per bed will suffice. This should be done one in two days, usually between 6 and 9 a.m.

*please turn over*

## VEGETABLES

### FERTILISER

As far as possible, organic manure should be used in fertilising your garden. But when there is no adequate supply of manure, application of a garden fertiliser like the Shell "Totafert" and the like serve.

### MARKET

Before three months from the date your nursery was established, you will see that your plant is producing fruits. The best method of harvesting is to pluck every morning and evening. When a good quantity is collected, you sell and get money in bulk.

### CONCLUSION

Principals of schools should therefore encourage the practice of Agriculture if they really want to produce useful youths for our country. To achieve this a portion of land should be set aside for farming and vegetable gardening.

# WEST AFRICAN SCHOOL CERTIFICATE & G.C.E SYLLABUS

## AGRICULTURAL SCIENCE (ORDINARY LEVEL)

*Candidates can be accepted for this subject only in accordance with regulations G.4(2), 4(3) and 5(3).*

### G. 4(2)

The Science syllabuses have been prepared on the assumption that the course will be based on practical work, and considerable weight is given, in the marking schemes, to the practical examinations. In order to ensure that passes in Science subjects are not awarded to students whose knowledge is obtained from books alone, no school may enter candidates in any Science subject unless it has been specifically recognized for that subject by the appropriate Ministry of Education. The Council reserves the right to inspect such schools. The Council does not attempt to prescribe a course of experimental work or even the number of periods to be spent in carrying out experiments since it does not wish to interfere with the freedom of schools in these matters. Candidates who have left school not more than a year before the date of the examination may be permitted by the Head of the school, at his discretion, to enter as school candidates.

### 4(3)

Schools seeking recognition for a specific Science subject (or subjects) must apply to the appropriate Ministry of Education for such recognition by 30 June, two years before the examination for which recognition is sought.

### AND 5(3)

Private candidates can be accepted for Agricultural Science, Biology, Chemistry, General Science, General Science (Additional) and Physics only

if (i) they have spent three years at a school recognized for these subjects, and (ii) they produce, when they enter, a certificate from the Head of their former school establishing this fact and stating that the Head is prepared to offer laboratory facilities during the examination.

Candidates offering Agricultural Science will be required to offer, in addition, General Science or Biology and Chemistry.

When Agricultural Science is taken together with General Science or Biology and Chemistry at the same examination, a pass may be awarded in Agricultural Science irrespective of the candidate's performance in General Science or Biology and Chemistry.

There will be three papers all of which must be taken:

PAPER 1 will be a 1½ hour practical paper.

PAPER 2 will be a 1 hour theory (objective) paper.

PAPER 3 will be a 2 hour written paper consisting of four sections.

There will be three questions in section A two in each of the remaining three sections B, C & D.

Practical work should form the basis of preparing for this subject. Candidates will be required to submit their PRACTICAL FIELD NOTEBOOKS for which marks will be awarded.

## DETAILED SYLLABUS

Candidates will be expected to answer questions on the topics set out in the column headed 'Syllabus'. The rates are intended to indicate the scope of the questions which will be set but are not to be considered as an exhaustive list of limitations and illustrations.

In order to help students preparing for examinations in Agriculture, we publish below this year's syllabus for the West African School Certificate at both Ordinary and Advance Levels.

## SECTION B: SOIL SCIENCE

It is desirable that schools presenting candidates for Agricultural Science should keep a School Farm, but where this is not possible, a well planned garden with small plots of farm crops of regular observation during growth is essential. At least two species of livestock, preferably one monogastic e.g. pigs, poultry, and one ruminant e.g., sheep, goat, cattle or a herbivore e.g. rabbit, guinea-pigs must be kept. The Field Note Books of the candidates should contain records of individual projects, farm activities and observations carried out on the school farm or garden.

It is also recommended that the study of Agricultural Science in the School Campus be supplemented by visits to well organized farms and/or Agricultural Research Stations.

## SECTION A: INTRODUCTION TO AGRICULTURE

### SYLLABUS

1. The meaning and importance of Agriculture.

*This should involve a discussion of the importance of Agriculture to man generally and its role in the economy of the relevant West African country, emphasizing that agriculture is a business.*

2. General principles of land use.

*This should be discussed in relation to the use of land for Agriculture, Forestry and wild life conservation purposes, bearing in mind the physical, economic and social factors, commercialisation, communication and marketing.*

3. Agricultural Systems: land tenure problems; shifting cultivation; crop rotation; continuous cropping; mono-cropping, mixed-cropping; pastoral and mixed farming.

4. Development of Agriculture: role of science and technology in development of Agriculture, including tools and source of farm power, Problems of development of local Agriculture.

Role of Government-Agricultural policies, regulations and programmes. Agricultural education, research and extension, credit facilities,

subsidies, quarantine, vaccines and farm settlement schemes.

5. Simple farm tools and Agricultural machinery: their uses and maintenance.

*Engineering details should be avoided.*

6. An elementary study of climate with particular reference to its effects on Agriculture. The main types and ecological distribution of crops (cereals, legumes, roots, vegetables, edible fruits, beverages, spices, drugs, oils, gums, latex, fibre); and animals (cattle, sheep, poultry, rabbits) found in West African countries.

7. Use of Agricultural and Forest products and their by-products.

*The discussion should include the use of agricultural and forest products for the provision of*

- (1) Food: fresh and processed;
- (2) Clothing: hides and skins, fibre, rubber etc.,
- (3) Shelter: Timber, gums, resins, etc.
- (4) Health: Drugs;
- (5) Fuel and Power: oil, minerals; and
- (6) Others.

1. Soil formation and properties: rocks-main types, rock weathering and factors of soil formation. Components and properties of the soil; position and properties of the soil; sand, silt, clay, organic matter; soil acidity. Soil texture and structure, and their importance. Water-retaining properties of humus and clay.

*Different soil types should be handled and the separation of a soil into sand, silt and clay fractions demonstrated. Water-holding capacity and drainage of a sandy soil, clay and soil with a high percentage of organic matter should be simply demonstrated by these soils in funnels.*

2. Soil and water conservation: depletion of soil resources by leaching, cropping, burning and oxidation of organic matter, erosion—its importance, causes, prevention and control—irrigation and drainage.

3. Soil fertility: plant nutrients; major sources of nitrogen, phosphorus and potassium. Maintenance of soil fertility; crop rotations, including cover crops and green manure; the living population of the soil and

its role in the carbon cycle (especially Earth-worm and Termite) and nitrogen cycle (especially nitrogen fixing bacteria); the use of commercial fertilizers and lime; the principles and practice of cultivation and their effects on soils.

## SECTION C: CROP SCIENCE

1. A review (with emphasis on their Agricultural implications) of plant parts, their functions, growth, development and reproduction.

2. Annual and perennial crop plants: external morphology, life-history, propagation, growth, cultivation, harvesting, storage, marketing and uses of local crop plants. Minimum of two

*please turn over*

crops from each of groups 1 to 6 should be selected from the list in the Appendix table below.

*Where there are two or more types in each group not more than one member of each type should be studied.*

3. Pastures and forage crops; recognition and study of main grasses and legume species commonly used in pastures. Natural pastures and their distribution. Important forage grasses and legumes and their uses.

*Detailed botanical studies are not required. Students will be expected to recognize on the basis of gross morphological appearance, at most for species of grasses and at least one species of legume used in pastures.*

4. Crop improvement: aims, methods, introduction, selection and cross-breeding.

*Chromosomes and Mendel's 'Laws' need not be treated in detail. A brief study of sexual and asexual methods of crop improvement. A comparison of a local variety and an improved variety of a crop plant can be made for demonstration.*

5. Weeds: their importance in Agriculture. Recognition of common annual and perennial weeds of local importance. Methods of dispersal and control of weeds.

*Herbicides can be mentioned but not details of chemical structure and mode of physiological action should be dealt with.*

6. Disease: a simple general account of diseases caused by fungi, bacteria, nematodes and viruses and nutrient deficiencies affecting crops. The nature of the damage, methods of transmission and common methods of control.

*Microscopic recognition of the causal organisms may be demonstrated where feasible.*

7. Pests: a general account of pests of crop plants and stored products, their types and importance; principles and methods of pest control.

*Study should include a general account of pests including rodents, birds and insects. An account should also be given of the life-cycle of a biting insect, e.g. grasshopper, a boring insect, e.g. a weevil, a sucking insect, e.g. an aphid.*

## SECTION D: ANIMAL SCIENCE

1. A review (with emphasis on the Agriculture implications) of the organs and tissue of animals and their functions.

*A discussion of various species of domestic animals, their uses, and the common breeds (exotic and local) of each of the species.*

2. Farm Animals: purposes of their production. Types and economic value of domestic animals locally produced

3. Elementary study of Animal Nutrition: Functions of carbohydrates, fats, proteins, minerals and vitamins. Feeding stuffs—sources of main nutrients; balanced rations; maintenance and production rations; malnutrition in farm animals.

*Details of formulation of diets and bio-chemical details of these major nutrients are not required.*

4. Reproduction in farm animals; heat period (oestrus); a general outline of the development, nourishment, respiration and birth of the young. Mammary glands; milk; lactation; egg formation; weaning of young.

*Details of cell division and of the anatomy of the early embryo and the formation of the foetal membranes are not required.*

5. Study of one animal from each of the following groups; study including the main aspects of general management, feeding and breeding.

- (a) cattle, sheep and goats;
- (b) pigs, rats, and dogs;
- (c) rabbits, guinea-pigs, horses, donkeys;
- (d) chicken, ducks, turkey, guinea-fowl.

6. Animal improvement: aims, methods: introduction, selection and cross-breeding (including the use of artificial insemination).

*Chromosomes and Mendel's 'Laws' need not be treated in detail. Comparison of a local breed and an improved breed of animal can be made for demonstration purposes.*

7. Diseases: a general account of important diseases in farm animals. Control: preventive and remedial measures.

*Local examples should be emphasized.*

8. Pests and parasites: insects and ticks and carriers of disease in farm animals. Life-history of one endoparasite of farm animals, e.g. ticks or lice. The principles and methods of control of pests and parasites of farm animals.

*Details of structure are not required.*

## APPENDIX TABLE

List of annual and perennial crops (See SECTION C. 1.2 of Syllabus).

- Group 1: Cereals: maize, millet, rice, guinea corn, wheat, tamba, acha.
- Group 2: Legumes: beans, cow peas, groundnuts, soya beans, bambaragroundnuts, yams, beans, pigeon pea.
- Group 3: Roots, tubers and vegetables: cassava, yams, cocoyams, potatoes, onion, charlots, pumpkins, tomatoes, carrots, okro, spinach, vegetable jute, lettuce, cabbage, cauliflower.
- Group 4: Edible fruits and nuts: avocado pear; bananas.

- Group 5: Beverages, fruits, guavas, mango, jackfruit, pawpaw, pineapple, cashew, water-melon.
- Group 6: Oils, latex and fibres: coconut, cotton, oil palm, shea butter sun-flower, sesame, rubber, sisal, kapok, jute, hemp.

rice and brown-rot of pineapple, nematodes of crops, parasitic seed bearing plants such as dodder and mistletoe, and nutrient deficiency symptoms.

4. Seeds, fruits, food storage organs and other parts of the main plants and local weeds.

Recognition of the structure of seeds and fruits of the main crop plants and of weeds in relation to the mode of their dispersal.

5. Tools

Recognition of common hand tools, e.g. cutlasses, hoes, forks, mattock, trowels, rakes, budding knives, shears, secateurs, chain measurer, sprayer etc. and their uses and maintenance.

6. Animal feed-stuffs.

Recognition and comments on the use of main animal feed-stuffs, e.g. palm kernel meal, blood meal, bone meal, maize, guinea corn, groundnut cake, fish meal and common forage crops, e.g. guinea grass, elephant grass, giant star grass, andropogon, calopogonium, pueraria, centrosema and stylosanthis.

7. Main pests and parasites of farm animals.

Recognition of main ectoparasites and endoparasites of animals, e.g. ticks, lice, tape-worms and round-worms, recognition of ill-health symptoms.

## AGRICULTURAL SCIENCE (ADVANCE LEVEL)

The syllabus that follows has been designed to portray Agricultural Science as an applied science with emphasis not only on the depth of but also in the acquisition of skills that are associated with the theory. It is therefore essential that candidates should make field trips to farms in different ecological areas and game reserves within the country, and

in different ecological areas and game reserves within the country, and should be exposed to the major products of the forest types in their country.

The syllabus has been designed to meet the needs of private candidates as well as those of school candidates. Candidates who wish to do a University course in Agriculture are advised to offer along with this subject at Advanced Level some other science subjects as may be necessary for entry requirements of the Universities.

It is desirable that candidates should have reached Ordinary Level standard in at least one of the following subjects:

Agricultural Science, Biology, Chemistry, Physics, General Science and Additional General Science.

The examination shall consist of three papers all of which should be taken.

### PAPER 1

2 - hour theory paper divided into three sections.

Section I: General Agriculture (5 questions).

Section II: Agricultural Economics (3 questions).

Candidates shall be required to answer four questions including at least two from Section I and at least one from Section II.

### PAPER 2

3 - hour theory paper divided into three sections.

Section I: Soil Science (4 questions).

Section II: Crop Science (4 questions).

Section III: Animal Science (4 questions).

Candidates shall be required to answer two questions from each section.

### PAPER 3 (Practicals)

A Farm Project to be assessed in the second term of the year of examination  
please continue overleaf

## PRACTICAL AGRICULTURAL SCIENCE

One hour and a half will be allowed for the practical test which can be taken in an ordinary classroom. The principal aim will be to test skill in observation and recognition. The practical note book covering the work of the entire syllabus, field work farm diary and project work will be examined and assessed.

NOTE: It is assumed that candidates will have gained adequate experience of every practical aspect of the entire syllabus.

1. Soil samples, rocks, and fertilizers.

Soil samples to be examined for texture by feel only, acidity by simple tests. Common rock types of igneous, metamorphic and sedimentary origin. Soil profile description. Recognition of common types of fertilizers and manures.

2. Growth, habitat and form of plants and animals studied as listed in Appendix Table (Groups 1 to 6) and sub-section 5 of Section D of the syllabus.

Recognition of parts and whole of the crop plants and farm animals studied.

3. Main pests and diseases of crops.

Recognition of main pests, their damage to crops, e.g. cotton stainer stem borers of cereals, weevils of grains and yam beetle. Recognition of main diseases of crops and their casual agents where feasible with characteristic symptoms, e.g. smut of cereals, maize rust, swollen shoot of cocoa, mosaic of cassava rosette and leaf-spot of groundnut, blast of

nation; and carrying 1/3 of the maximum marks for the practicals.

### PLUS a 3-hour practical paper.

Note: (1) The content of the syllabus for the Practical could be examined in the theory papers and vice-versa.

(2) Paper 2 alone may be offered as a Subsidiary Paper for H.S.C.

#### (3) Farm Project

The Farm Project would be assessed by an examiner of the Council. The Project Work would be inspected in the 1st term of the 2nd year or when the Project is at its peak. Schools will therefore be required to inform the Council of the Project Work being carried out by the students at the end of their first year.

## DETAILED SYLLABUS

### A. General Agriculture

#### 1. Introduction

(a) Meaning and importance of Agriculture.

(b) Factors that determine the pattern of agriculture-ecological and sociological basis: ecological distribution of crops, animals and forests.

(c) Agricultural systems: principles and practice of cultivation nomadism, shifting cultivation, mixed cropping, crop rotation and mixed farming.

(d) The contributions of Agriculture to the national economy.

#### 2. Development of Agriculture

(a) Problems of subsistence agriculture-land tenure, education, health services, communications, soil erosion, transpor-

tation, attitudes, poor tools, government agricultural policies.

(b) General World Survey of the development of Agriculture with special reference to West Africa.

(c) Role of Science and Technology in the development of Agriculture.

(d) Administration of agricultural production and the role of government-agricultural policy, research, extension education and services,

education and services, financial assistance to farmers, veterinary services and quarantine services.

3. Land Tenure System and the Principles of Land use for Agriculture, Forestry and Wild Life Conservation.

Factors affecting land use-topography, economic and social factors, population, situation of land for commercialisation, farm settlement schemes, development, management and conservation of forests and soils.

#### 4. Fisheries

Distant sea, coastal and

Distant sea, coastal and inland water fishing, fish ponds curing, handling and distribution of fish. Marine products other than fish.

Note: Fish species to be mentioned Fishing equipment to be discussed.

#### 5. Agricultural Engineering and Surveying

(a) Problems and prospects of mechanization of agriculture in West Africa.

(b) Tools, implements and machineries-uses, care and maintenance.

(c) Sources of power on the farm-wind, water, electricity, heat engines and animals.

Brief discussion on the working of the internal combustion engine.

(d) Farm surveying farm buildings and constructions (simply treated).

(e) Mechanization peasant agriculture.

### B. Soil Science

#### 1. Genesis and Classification of Soil

(a) Rocks and minerals-their characteristics and simple classification.

(b) Weathering Processes

(i) Expansion and abrasion agents; water, wind and temperature.

(ii) Chemical Processes

Hydrolysis, hydration, oxidation, solution and reduction.

(iii) Biological Processes: Effects of organisms.

(c) Soil Formation

(i) Factors of soil formation-climate and vegetation, relief and drainage, parent material, living organisms, time.

(ii) Soil profile-soil horizon, soil profile defined: Genetic horizons of ideal profile specific to the area. Importance to Agriculture.

- (d) (i) Principles of soil classification.
- (ii) Kinds of soils in the local area and their existing classification.

## 2. Composition of the Soil

- (a) (i) Physical composition of the soil: soil components, soil structure, soil texture, soil air, soil water and soil temperature.
- (ii) Mineral composition of the soil: Quartz, feldspars, micas, clay minerals, montmorillonite etc., colloids and colloidal systems, collids defined, properties state of colloidal system sol, gel.
- (iii) Organic components of soil-organic material, substance and matter; humus.

## B. Effect of Soil composition on properties of the soil.

### 3. Soil Fertility

- (a) Plant Nutrient Elements
- (i) Classification Macro-N,P,K,Ca, Mg,S Micro-B,Cu,Zn,Mo, Co,Fe,Mn.
- (ii) Factors leading to loss of these nutrients: Leaching, erosion, crop removal, etc.
- (iii) Replenishment of lost nutrients: Soil organisms: Micro-Marco-, effect of soil organisms on the soil, Nitrogen cycle; and carbon cycle; rock weathering, fertilizers.

- (iv) Soil management as an attempt to strike a balance between loss and gains in soil nutrients.

### 4. Soil Conservation

- (a) Types of irrigation and drainage.
- (b) Soil erosion: Types, effects and control.
- (c) Methods of soil conservation: terracing, contour farming, strip cropping, cover crops, mulching, etc.
- (d) Water pollution and recovery (where it applied).

## C. CROP SCIENCE

Candidates should be familiar with agricultural and botanical methods of classification of crops

methods of classification of crops as well as the identification, morphology and reproduction of important crop plants.

### 1. INTRODUCTION

Origin and geographical distribution of some important tropical crops including forage crops. Nomenclature and classification of crop

ture and classification of crop plants. Examples should be drawn from the major classes of locally cultivated crops.

### 2. FACTORS AFFECTING CROP PRODUCTION

Ecological physiology of crop plants: the primary effects of light, radiation, temperature, water and inorganic elements on crop growth, development and yield.

### 3. PRINCIPLES OF CROP PRODUCTION

Land preparation.

Methods of propagation: seed selection and testing, vegetative propagation. Nursery practises: time of planting and planting distances.

## 4. PRINCIPLES OF PLANT BREEDING AND CROP IMPROVEMENT

- (a) Aims of crop improvement;
- (b) Basic genetic principles of crop improvement;
- (c) Methods of crop improvement:
- Introduction and mass selection; hybridisation; multiplication; vegetative propagation.

## 5. PRINCIPLES OF PLANT PROTECTION

- (a) Diseases of crop plants: Causal agents, symptoms, methods of transmission and eradication of diseases associated with the crops studied.

### (b) CROP PESTS

- (i) Classification of field and storage pests; extent of damages: e.g. insect pests, nematodes, rodents, birds and human beings.

- (ii) Principles of pest control: mechanical, biological, cultural and chemical.

### (c) WEEDS AND THEIR CONTROL

- (i) Identification of common weeds and modes of dispersal; study of selected weeds with particular reference to locality.

- (ii) Control: mechanical biological, cultural and chemical methods.

## 6. STUDY OF SELECTED CROPS

Origin, geographical distribution; climatic and soil requirements: cultural practices, harvesting, processing marketing and storage of West African arable crops, cash crops and vegetative crops.

*please turn over*

The study should include at least one cereal from group 1, one legume from group 2, and four plants chosen from at least three of groups 3,4,5 and 6 below:-

#### GROUP 1

#### CEREALS

Maize-Zea mays.

Millets-Pennisetum typhoides, Setaria italica, Eleusine corocana

Rice-Cryza sativa

Guinea Corn-Sorghum bicolor (S. vulgare)

Wheat-Triticum vulgare

Tamba

Acha

#### GROUP II

Beans-Phaseolus spp

Cow peas-Vigna unguiculata

Groundnut-Arachis hypogea

Soya Beans-Gycine soja

Bambara groundnut-Voandzeia geocarpa (V.Subterranea)

Yam bean-Sphenostylis steno-carpa

Pigeon pea-Cajanus cajan

#### GROUP III

Cassava-Manihot esculenta

Yams-Doscorea Spp

Cocoyams-Araceae (Colocasia or Xanthosoma)

Potatoes (European P)-Solanum tuberosum (Hausa P.)-Plectranthus esculentus

Sweet Potatoes-Ipomoea batatas

Onions-Allium cepa

Shallot-Allium ascalonicum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicum esculentum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicum esculentum

Carrots-Daucus carota

Cabbage-Brassica oleracea

Cauliflower-Brassica oleracea, var. botrytis.

Graden egg-Solanum melogena

#### GROUP IV

Avocado pear-Persa gratissima

Bananas-Musa Spp

Citrus-Citrus Spp.

Guava-Psidium guajava

Mango-Mangifera indica

Pawpaw-Carica Papaya

Pine-apple-Ananas sativus

Cashew-Anacardium occidentale

Water melon-Colocynthis citullus

#### GROUP V

Cocoa-Theobroma cacao

Coffee-Coffea Spp.

Colanut-Cola Spp.

Benniseed-Same as Sesame

Ginger-Zingiber officinale

Sugar cane-Saccharum officinarum

Peppers-Piper nigrum.

#### GROUP VI

Coconut-Cocos nucifera

Oil Palm -Elaeis guineense

Cotton-Gossypium Spp

Shea-butter-Butyrospermum park ii

Sunflower-Helianthus annuus

Sesame-Sesamum orientale

Rubber-Hevea brasibensis

Sisal hemp.-Agave Spp.

Kapok-Ceiba pentandra

Kenaf.

Urena lobata.

#### 7. PASTURES AND FORAGE

Pasture agronomy, grasses, legumes, their distribution, improvement, quality and assessment, establishment and conservation.

#### D. ANIMAL SCIENCE

##### 1. Introduction

Role of livestock and livestock products in West African countries.

##### 2 FARM ANIMALS

Types and classification of locally available breeds of cattle, sheep, goats, swine, poultry.

#### 3. ANATOMY AND PHYSIOLOGY

(a) Brief gross anatomy of named domestic animals: cattle, goats, horses, pigs, sheep, rabbits, poultry and fish.

(b) Physiology of digestion, reproduction, lactation, milk let down, egg formation and laying, circulatory, and endocrine systems.

(c) Environmental physiology: The direct and indirect effects of climate (tropical) on farm animals with due regard to their effects on grazing habits, growth, reproduction, milk production, egg production, gross yield and quality of food supply.

#### 4. ANIMAL NUTRITION

(a) The main nutrients—carbohydrates, proteins, fats, minerals, vitamins, water—their chemical composition and their role in animal nutrition. Malnutrition in farm animals.

(b) Feeds and feeding-me' preparation of foodstuff animals-cooking, cutt ding, pelleting etc.

*Note: Emphasis should be laid upon the reason for feeding these forms of feeds to the different types of animals.*

(c) Principles of ration formulation—balanced maintenance, production, starter rations.

*Note: Mathematical and technical details of ration formulation will not be required.*

#### 5. ANIMAL HEALTH

##### (a) DISEASE

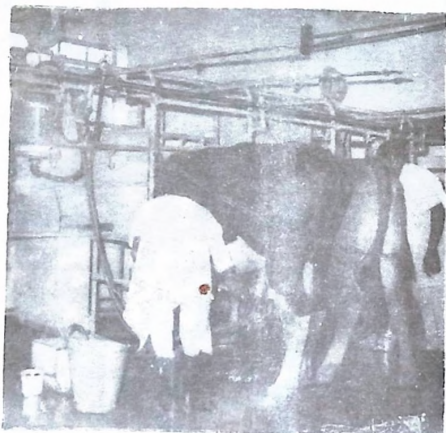
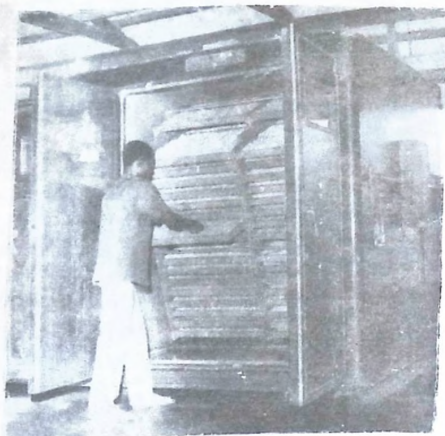
Causes and prevention; pest and parasite control; insects and ticks as carriers of diseases in farm animals. Life history of one endoparasite of farm animal (e.g. liverfluke, roundworm, tape worm, trypanosomes); and one ectoparasite (e.g. ticks and lice).

(b) Diseases as the limiting factor in the development of animal

*continue on p.20*



# NEPA



Rural Electrification Projects being carried out by National Electric Power Authority will promote mechanised farming and increase productivity and improve standard of living in the rural areas.



**NATIONAL ELECTRIC  
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# FARMSTOCK

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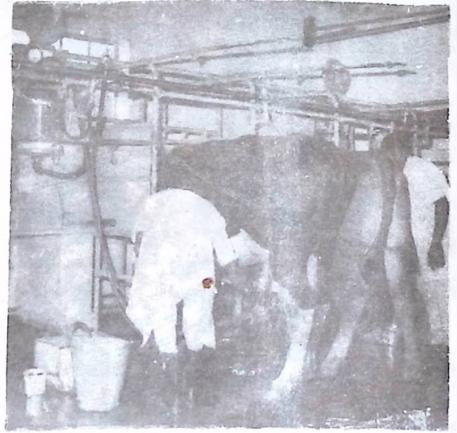
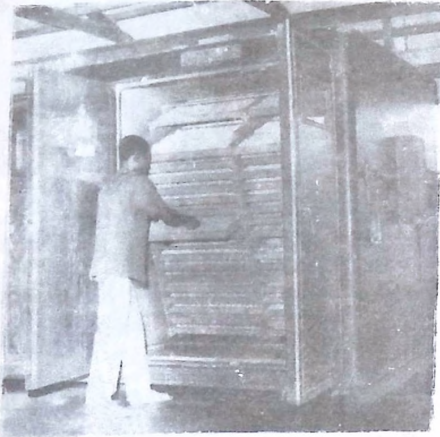
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**CHIEF E. O. LADEBU-ADEBAKI** p. 18

## **CROP SPRAY BEATS DROUGHT**

**A** discovery of Dr. Terry Mansfield of the University of Lancaster in northern England may have widespread applications in arid conditions or where sudden drought threatens the loss of a crop.

Plants lose a lot of water through their leaf surface—a process known as evapotranspiration. Something like a third of water fed to plants in the form of irrigation can be lost in this way. The process, however, has always been assumed to be essential to the plant's health.

Dr. Mansfield has shown that by spraying crop plants with the hormone abscissic acid the pores of leaf surface close and water loss is reduced significantly. In test under laboratory conditions it has been found that a plant's water requirements can be halved for about nine days without apparent damage.

The potential of Dr Mansfield's discovery is enormous. If water were to be in short supply it would be possible to spray abscissic acid as a means of both saving the crop and conserving water supplies.

**Dr T. Mansfield, University of Lancaster, Lancashire, England.**



# FARMSTOCK

WEST AFRICAN FARMERS' &  
COOPERATIVES' MONTHLY

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Chief E. O. Ladebu - Adebaki

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**DIZENGOFF BID AGRIC. MANAGER FAREWELL**



That it was not how long but how well a person handled a situation would determine that person's quality formed the crux of the various farewell speeches made recently at a lively send-off Party arranged in honour of Mr. B. Langer, agricultural economist and Manager of the Agricultural Department of Dizengoff W.A. (Nig.) Ltd, Apapa.

Mr. B. Langer after four years was leaving the country. It was significant that within his short stay, the Agricultural Section which was a very tiny annex of the company has grown to become a full Department known in all parts of the country on various agricultural issues. Responding to his toast, the guest of honour corrected the general notion that he alone brought the marked improvement to the Agricultural Department and to the company generally but that it was the outcome of devotion to duty not only by his direct staff but also attributable to the proper coordination by the various sections acting in unison. The party was well attended.

Presentations were made by the staffs of the various sections of the company. The new Agricultural Manager is Mr. Gillai also an Agricultural Economist.



Mr. Gillai

**AGE GROUP LAUNCHES NEW FARM**

The sum of N10,000 was raised by the BICHI age group in Osokom Clan of Boje Touring Area when they launched the first phase of the community farm project estimated to cost N30,000.

The spokesman for the group, Mr. George Obiem Alang said the aim of establishing such a farm was to boost food production in the area in order to feed the growing population.

He further disclosed that the farm which has a total acreage of 100,000 was mainly for yams and cassava cultivation adding that 40,000 yam seedlings would be planted in the next planting season.

He assured the community that about 200,000 yams will be harvested at the farm annually.

**SHEEP FARM FOUNDATION LAID**

The foundation stone has been laid for a sheep farm at Odjiba, a small village about 100 km from Brazzaville recently.

The Chairman of the Executive Committee of the Pool Region spoke of the importance of this farm to the economy of the Pool Region and the nation's food supplies.

Meat was still a luxury in the country and production must be raised threefold to make meat available to all.

The Minister of Agriculture and stock-breeding, Charles Nguoto said there were great possibilities for modern stock-breeding in Congo which had been making various efforts to increase and improve cattle stocks.

The Odjiba sheep farm is planned to accommodate 15,000 to 20,000 head of goats and sheep. They will be bred for the meat market.

**N2.5 INDUSTRY FOR KWARA**

A N2.5 million mechanical processing industry is to be established in Ballah near Ilorin, Kwara State.

The Industry which is to go into production about the end of this year, is being established by the Ilorin based private company - Kwara Consolidated Advancement Company (KCAC) in conjunction with an overseas partner - Messrs Newill Dun Food Engineering Company.

Announcing this in Ilorin, the project Director Mr. Olusegun Olajengbesi said that his company has so far acquired an eight square mile land for both the cultivation of cassava and the mechanisation of Gari in Ballah village.

**COMMUNITY RECONSTRUCTS**

Construction work has begun on the new primary school block in Orimekpang, Boje Touring Area of Ikom Division at an estimated cost of N5,000.

Already, a sum of N1,038 has been raised by the community for the construction work and the people had earmarked the sum of N542 for the construction of a community cassava farm be sited within the development area and that work on the project would begin soon.

## **N6m EXPANSION PROJECT**

The Government of the Federal Republic of Germany is to provide Kenya with a loan of nearly N6 million for the expansion of the Chemelit sugar factory.

The agreement to this effect has been signed in Nairobi by the Permanent Secretary in the Ministry of Economic Planning and the German Ambassador.

The loan will enable the company to meet with the cost of new equipment for more sugar production.

## **N500,000 PLEDGED TO CGIAR**

Nigeria has announced its intention to become a donor member of an international grouping of countries and foundations dedicated to increasing food production through research efforts.

As a donor member of the Consultative Group on International Agricultural Research, Nigeria has pledged N500,000 in support of international agricultural research activities during the coming 1976.

The Nigerian contribution will go to four different international research centres. Three of the centres are located in Africa, a fourth - the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) - is located in Hyderabad, India.

Including Nigeria, there are 31 members of Consultative Group.

## **PROJECTS AID RICE GROWTH**

Many developing nations of Tropical Africa are looking for rice to help overcome their problems.

Throughout West Africa efforts are being made to increase rice production.

One of the most promising effort in Nigeria is the U.S. assisted accelerated food programme which helps to promote good management and the use of fertilizers and insecticides.

*please continue overleaf*

# **TRADE FAIR**

**THE THIRD GHANA INTERNATIONAL  
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**and**

**ALL GHANA MISSIONS  
ABROAD.**

*(Issued by the Information Section of the GHANA HIGH COMMISSION, Lagos)*

● The United States and Britain will give the West African Rice Development Association (WARDA) grants totalling 1,037 million Naira under agreements signed in Monrovia recently.

The grants will be used to finance research for quality seed, training qualified personnel and for instructing farmers in rice-growing.

The British grant totals 200,000 Naira and the United States Agency for International Development (USAID) grant is 737,000.

The USAID contribution will be used for the establishment of a research farm at the University of Liberia and to provide scholarships for rice research and production specialists from every WARDA country including Liberia.

## N6m LOAN FOR EXPANSION OF SUGAR FACTORY

The Nigerian Sugar Company Limited, Bacita, is to embark on a N6 million expansion project.

This was recently announced by the chairman of the company, Alhaji M. Waziri at the company's agricultural seminar.

Alhaji Waziri stated that the expansion project would increase the yearly production of sugar by 15,000 tons — and that the scheme will include the increase of the present size of sugar fields.

At the seminar, irrigation, problems of land development and mechanisation in the sugar can fields were also discussed.

## PRICES OF FOODSTUFF GO UP

The secretary of the Akure Chamber of Commerce Mr. John Komolafe, described the present situation as "horrible and unprecedented" adding that unless something was done by the authorities, there could be chaos in Akure and other parts of Ondo province.

Traders in some parts of Ondo province, Western State, have cashed in on the recently announced Udoji awards to raise prices of foodstuff.

Report from Akure recently said that prices of commodities including milk, sugar and foodstuff have gone up by more than 60 per cent.

## GETTING RID OF THE WORLD'S WORST WEED

The powerful herbicide, glyphosate, has been found "totally effective" in the control of nutsedge (*Cyperus rotundus*) claimed by agriculturalists to be the world's worst weed. Glyphosate will be marketed commercially in a few years.

Glyphosate, developed originally by the Weed Research Organisation in Oxford, has been tested by a member of the organisation's staff attached to the Tropical Pesticide Research Institute in East Africa. These trials have shown that in plantation of crops like coffee the new treatment is safe and reliable.

The annual report of the Agricultural Research Council stresses that glyphosate travels rapidly through the interwoven stems and tubers (swellings) of the weed, killing "far more" weeds than other herbicides.

The Weed Research Organisation has also demonstrated that bindweed — a serious problem with fruit bushes and trees — can be controlled with the hormone weed-killers 2,4-D and MCPA. Bindweed (*Convolvulus arvensis*) has proliferated with the use of soil applied herbicides to control annual weeds.

## MORE TO EARN FROM AGRICULTURE

The process of agriculture development in Nigeria has been undertaken largely by illiterate farmers.

Now, the peasants who have been the "engine of growth" of the agricultural sector are being blamed for the scarcity of foodstuffs and the apparent sceptre of famine.

In the history of Nigerian Agriculture, from 1900 to present time, one will see that the peasants have not only endured to keep the agricultural sector going but also made economic sacrifices to bring about economic developments in the other sectors of our economy.

From the standpoint of agricultural development, Colonial land played a vital role in the organisation of agricultural production: thereby making it possible for peasantry to own and farm their own lands.

However, from 1940–1960, colonial government set up institutions which influenced subsequent agricultural development.

The Nigerian institute for Oil Research and the West African Research Institute known as the Cocoa Research Institute of Nigeria established during this period.

The 1945 Colonial Development and Welfare Act stated in its objectives, the concentration on a limited range of export crops.

Export crops having been linked with railways, expanded rapidly — cotton increased by 300 per cent while rubber production increased twenty fold — and Cocoa and Groundnuts doubled.

Most of these increases were caused by improved research methods and use of chemicals.

Nigerian agriculture from 1900–1960 could be regarded as a boutique sector with the export sector earning most of our foreign exchange.

Gradually our foreign reserves were being used to import food while the agricultural sector experienced depression. No sufficient foodstuffs were grown and the high rate of inflation made matters worse.

Nigerian who had taken agriculture for granted owing to its past performances and owing to the newly found oil — wealth suddenly realised that they could not eat "oil" and we consequently faced with the spectre of famine.

The 1970–74 allocated agricultural N215 million to cover a number of agricultural projects.

The need for an agricultural revolution finally reached the ears of the powers and in the 1975–80 plan, sum of N1,400 million was allocated to the agricultural sector for various projects.

In addition to this sum of N1,400 million allocated to agriculture, it would be wise to further suggest that the government invest another N7

million to make sure that the projects outlined during this plan period are not abandoned owing to inflation as was the case in the 1970-74 plan.

The Nigerian Army being a dominant sector consuming foodstuffs should be made to grow their own foodstuffs in their own farms.

Some villages in Nigeria could be turned to "community farms" and in addition, some of the N700 million should be used to set up a machinery centre where private farms can borrow tractors and other equipment for use in their private farms.

While investing in agriculture, government should also link village farms with good roads and provide storage facilities for perishable goods.

The oil wealth should therefore be pumped into the agricultural sector to bring about meaningful results - increase in productivity.

## MILK PROJECT SOON

The Kwara State Government has started a project for the processing of fresh milk for the consumption of the people.

This was made known by the State Commissioner for Agriculture, Mr. J. A. Ogbaha.

The new project is designed to make surplus milk produced by cattle farmers around Ilorin, the Commissioner added.

The scheme would also further the financial and social obligations of the farmers and would also solve the acute shortage of animal protein presently facing the country.

## OBUBRA NORTH FARMERS BEAT ALL

Farmers in Obubra Division planted a total of 430 hectares of cocoa, oil palm and rubber during the last planting season.

Breaking down these figures, it shows that 220 hectares was for

Breaking down these figures, it shows that 220 hectares was for cocoa, 177 hectares for oil palm and 33 hectares for rubber.

Farmers in the area have been called upon to increase their output and reminded them of the need to utilise the government subsidy properly in order to achieve their objective.

These were disclosed recently in Obubra by the agricultural extension officer for Obubra division, Mr. P. J. Umonah.

He further added that the Obubra North County Development Council

He further added that the Obubra North County Development Council area alone produced 164 hectares of cocoa.

## GOVERNMENT ADVISED TO BOOST AGRICULTURE

The Mid-West Government has been advised to give such attention to farmers since agriculture is the economic live-wire of the state.

The call was made recently at Irrus in Ishan division by Chief G. E. Odiase.

The Chairman contended that farmers in the rural areas were generally backwards than town dwellers - the reason for their backwardness being that they live far away from progressive and civilised influence, means of easy communication, transports and access to news.

Chief Odiase concluded that encouraging industrial, agricultural, and commercial activities would solve these problem.

## 20 MID-WEST FARMERS GET LOANS

A total of N391,000 has been approved by the Midwest Ministry of Agriculture and Natural-Resources, as loans to 20 small and medium-scale farmers in the state for the 1974/75 financial year.

Government of the Mid Western State also granted N177,000 as loans

to nine farmers during the 1973/74 financial year.

According to the release issued by the ministry in Benin recently, the gesture was in line with government's policy to encourage farmers in developing existing food crops, oil palm, plantation, fish and livestock projects.

The present loan ranges from N5,000 to N24,000 per farmer, the ministry explained.

## APPEAL FOR LUCRATIVE FARMING

Government of the federation has been called upon to help make farming a lucrative business to attract thousands of young people now roaming streets of our townships in search of jobs.

It had also been noticed that only total government involvement in agriculture could make this possible.

The call was made recently in Nsukka by a senior lecturer in the department of Agriculture at the University of Nigeria, Nsukka, Dr. Lawrence Obibueku.

Dr. Obibueku also called on the government to allocate substantial sums of money in development plans to agriculture if the nation is to avoid serious food crisis in the near future.

## N4.5m LOAN TO FARMERS

The North Western State government has received a loan of N4.5 million from the Nigerian Agricultural Development Bank.

Speaking during the signing ceremony in Sokoto recently, the Commissioner for Agriculture and Economic Planning, Alhaji Ibrahim Tanko Galadima explained that the loan would be given under short and medium term basis to farmers.

Under the agreement, about 2,500 farmers would receive loans to increase their millet, guinea corn, groundnuts, rice and cotton production.

## AGRICULTURAL SOCIETIES GET N4m LOAN

A total of N4 million has been granted to over 100 village agricultural societies with about 10,000 members by the North Eastern State Ministry of Co-operatives and Community Development for the purchase of fertilizers during the 1974/75 agricultural season.

The aim is to create viable co-operatives and Community Development Alhaji Muhammadu Gujbanu.

The Commissioner pointed out that another programme which was recently launched to promote group Co-operative farming societies towards large scale farming was adequately backed by agricultural machinery and supplied including fertilizers.

## FARMERS NEED MORE AID

The Federal Government and the State Governments have been called upon to intensify their support to farmers in the country in order to maintain higher food production in the coming planting season.

This call was made at Umuahia recently by the resident for Umuahia, Mr. H. Chukwudofe.

The Resident also suggested that farmers should be given a substantial loan to enable them purchase modern implements for farming.

He emphasised the need for adequate food production in order to cope with the present population growth.

## N10,000 FARM PROJECT LAUNCHED

A N10,000 farm project has been envisaged by the Rebisi Age Group 39 to be launched soon this year.

This was disclosed by the Chairman, Mr. Cyril W. Boms, during the group's 1975 annual get together.

Mr. Boms also called on all Rebisi people of the age group to support the farm project, which he pointed out, would enhance the economy of the area both industrially and agriculturally.

## CASSAVA INDUSTRY SOON

A cassava industry is to be established at Igueben in Ishan Division in the Mid Western State.

The industry, which is going to be the second of its kind in the country, will be sited at Oka water-side.

The industry is aimed at boosting the economy of the town, minimising unemployment and checking population drift.

These were disclosed recently at Igueben by the Onojie of Igueben Chief Davie Elojerio Imado-jemu.

## LACK OF COMMUNICATION

The Kwara State Commissioner for Economic Development, Dr. R. A. Adeleye, has said that lack of adequate communication between Nigerian modern agriculturists and the peasant farmers might constitute an obstacle to achieving an agricultural revolution.

Dr. Adeleye appealed to students of institutions of agriculture in the country to realise that their role in society, if they were to play it fully, must not be that of white - collar farmers but of people who not only appreciate the problems of peasant farming in Nigeria, but are willing to fully identify themselves with the ordinary farmers in the efforts to achieve a revolutionary transformation of the methods of agricultural pursuits in the country.

## N1.5 LOANS TO CO-OP UNIONS

The North Western State Government has approved 1.55 million Naira loan for co-operative unions for the 1974/75 buying season.

Speaking at a conference of co-operative officers in Minna recently, the North Western State Commissioner for Trade Industry and Co-operatives, Alhaji Abubakar Tunau, called on them to make good use of the loan and work hard in this year's produce marketing

## FARMERS TO GET GOVERNMENT AID

The government will continue supply oil palm seedlings to genuine and progressive farmers under World Food Programme to enable them increase their present holdings output.

This was made known recently Udi by the agricultural officer in charge of Udi division of the Central State, Mr. F.I. Omali.

Mr. Omali spoke of the importance of palm oil in the overall economic development of the East Central State and called on farmers to direct effort towards establishing and expanding their oil-palm plots to check the rising price of the commodity.

The objective of the programme he added is to assist farmers maintain their plots established since the end of the civil war and also to help establish new ones for increased productivity.

## NIGERIANS ON FISHERIES

### COURSE IN BRITAIN

Four Nigerians are attending course on fisheries management probably the only one of its kind in the world, which started in September at Grimsby Technical College.

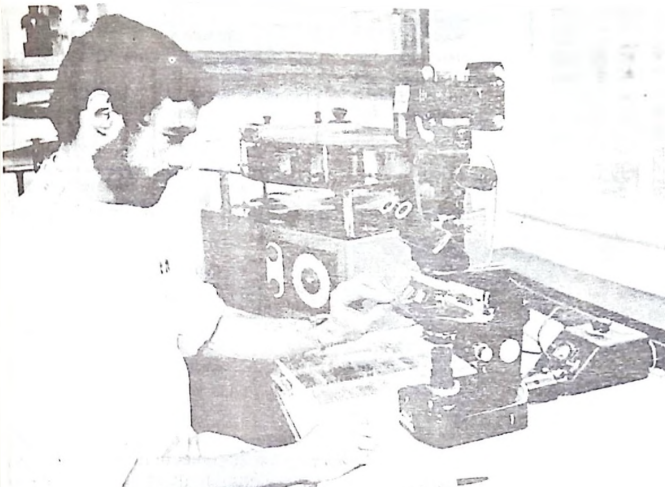
Mr. B. N. Obibuonyi, an administrator from Enugu; Mr. O.O. Olatunbosun, Supervisor of reservoirs and rivers in Ibadan; Mr. A.A. Olaniawo, Fisheries Officer in Iwo; and Mr. D.G. Ndah, Fisheries Officer in Gambe are among 17 fisheries officers from developing countries being sponsored by the Ministry of Overseas Development on the year's course.

The course is for officials likely to reach senior rank and covers a wide range of subjects that Chief Fisheries officers need today - from resource identification to the marketing and distribution of fish. It includes such subjects as practical fishing by great variety of techniques, boat and gear design and management, resource management, fisheries economics and the organisation of fisheries co-operatives.

The participants will be visiting industrial and research establishments throughout the United Kingdom

# "GO SLOWLY" warning on biological pest control

by Peter Bowman  
a London Agricultural Journalist



*Microscopical examination of insect parts at Britain's Centre for Overseas Pest Research. The Centre, one of the scientific units of the British Government's Overseas Development Administration, undertakes research in the fields of pest biology, ecology and population dynamics as well as pest control.*

All over the world agricultural scientists are seeking faster and surer ways of protecting crops from the ravages of insects and other pests.

Many research centres are working on viruses, thought to be highly selective in their effect, to control insects to which Africa's crops are particularly vulnerable — both before the harvest and during the post-harvest storage period.

Professor J.M.J. Way of Britain's Imperial College, chairman of the Pest Control Panel of the United Nations Food and Agriculture Organisation, says that to keep food production apace with population growth "every conceivable method of pest control, natural or artificial, must be used." And his panel recommends that increased scientific attention should be paid to the development of insect viruses.

## SUCCESSES

During the past quarter of a century at least seven insect viruses have been used successfully on a

During the past quarter of a century at least seven insect viruses have been used successfully on a large scale and more than 25 others have been shown to have good potential for pest control. The possibility of using viruses instead of organic pesticides is seen as particularly attractive by many specialists because the micro-organisms are thought to be less harmful to the environment than the toxic chemicals in much wider uses.

But a group of British scientists have now sounded an urgent alarm. Writing in "Nature", the distinguished scientific journal, Dr. T. W. Tinsley of the Invertebrate Virology

Unit, Oxford University, questions whether in fact viruses do provide such a highly selective control, as has been supposed.

For Dr. Tinsley and his co-workers have discovered that several animals in Britain have a natural defence — antibodies — to a virus found in an East African moth.

A specialist explains that antibodies are formed when the body is challenged by a foreign invader, such as a virus. But as the moth lives only in Africa it was unlikely that its virus could have provided the challenge in the pigs, cattle, sheep, horses, dogs and even deer in Britain.

The likely cause was probably a related virus of the same family. And if animals react in that way to an insect virus then the practice of using insect viruses as insecticides on a large scale becomes questionable.

All of which does not spell the end of microbiology in agricultural pest control. Most insect viruses are probably highly specific in their effect, the Oxford scientists say, but extreme caution and much further research is needed before insect "epidemics" are unleashed on pests so that we can be sure that they remain within the bounds intended by man.

## CONTROL OF INSECT PESTS

Pioneering work in using radar to track and identify insect pests which could lead to effective control, has been carried out on a Nuffield grant by a team from Loughborough University of Technology, and several expeditions have been mounted to Australia and Africa to collect observations and data.

The foundation has been financing studies by the University of Western Australia that indicate that only a minor degree of undernutrition in both animals and humans, when the brain is growing, may result in varying degrees of retardation.

(Nuffield Foundation, Nuffield Lodge, Regents Park, London NW1 4RS).

Our poultry correspondent advises on

# HOW TO CHOOSE DAY-OLD CHICKS

Modern poultry keeping is a skilled business which needs expert management to make good profits. Good management starts with buying the right type of day-old chicks, ones capable of growing into profitable layers.

Such chicks should be scientifically bred and hatched in a hygienic hatchery. The hatchery which produces them should be one which takes an interest in the farmer's success with their stock and will help him with advice and delivery.

## WELL-BRED CHICKS

Breeding better chickens is a difficult and complicated business. Some of the ways in which Poultry scientists do this are explained later in this series.

Here, we are concerned with only the objects and results of their efforts. Layers are bred to produce the maximum PROFIT PER BIRD, profitability being the result of a combination of several factors:

1. Adaptability of the bird to farm conditions
2. Low feed consumption
3. High egg production
4. Large egg size
5. Good liveability
6. Good carcass weight at the end of lay

## HATCHERY HYGIENE

The farmer who buys day-old chicks requires healthy birds. The hatchery and the breeder have to spend much time and effort in producing healthy and disease-resistant birds.

Each individual bird is tested before its eggs are taken for hatching.

Every egg laid is collected promptly from the poultry house, dipped in sanitant and stored in a specially cooled room until it is required for setting in the incubators.

Only clean well-shaped eggs, free from cracks, are used for hatching. The last three days of incubation are



in separate hatching machines, kept in a different room from the setters so that a complete disinfection after hatching can be carried out without affecting the following week's eggs.

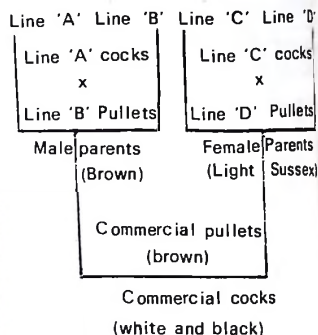
## SERVICE AND ADVICE

Most hatcheries maintain an after sales service, suppliers never lose interest in the chicks they have produced. They want you to get the best out of their birds so that you can build up a profitable business and continue as a satisfied customer for many years.

To help you do so, they gladly put their knowledge and experience at your disposal.

## WHAT IS HYBRID?

A hybrid chick is the result of crossing two, three or four strains of birds. Most hybrids are four-way crosses, bred from four strains each. For example:—



There are two reasons for this complicated breeding plan. Firstly, it combines the good qualities of the several strains all into one bird, "hybrid vigour" to produce an outstanding commercial chick.

"Hybrid vigour" is the name given to the improvement in performance of a hybrid chick over that of its parents. It is responsible for an improvement of up to 50 eggs per bird over the parent strains. Selecting the best birds for use as grandparents for commercial birds is a complicated task.

Two main methods are used. Firstly, the strains used at present are constantly being improved by selection within the strain. Secondly, hatcheries are constantly searching for new strains or crosses which could prove even more profitable for poultry farmers than those they sell at the moment.

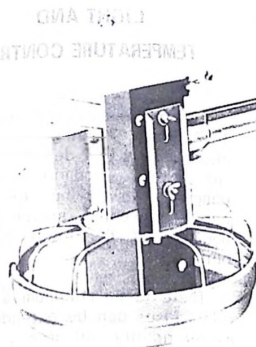
These two programmes for improvement include recording the performance of over 200,000 experimental layers each year, kept under a wide variety of conditions and derived from over 150 separate pedigree strains. Such breeding research involves an annual expenditure of over N400,000 per year.

*continue on page 12*

**LACO** more than 20 years of experience  
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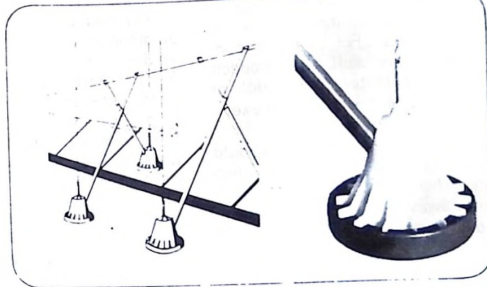
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## HOW TO CHOSE DAY-OLD CHICKS

The benefits of this huge research programme are being made available to Nigerian poultry farmers by the various hatcheries in the country today. New parent stock are imported to their farms three times a year to make sure that their very latest improvements have been incorporated in the day-olds hatched at intervals.

### GOOD HOUSING

The purpose of housing poultry are:-

- (a) To keep the birds under the owner's control
- (b) To protect them from other animals and from theft
- (c) To provide conditions in which disease is kept to the minimum.
- (d) To provide the poultry with their needs for food, water and nests in a convenient arrangement for the owner
- (e) To provide as good temperature, ventilation and humidity as is economic.
- (f) To control light.

The first two points need little comment. Half-inch wire netting should be used to keep wild birds or rats out of the poultry house. Concrete floors and roofs which cannot harbour vermin are advisable.

### DISEASE CONTROL

(a) All housing and equipment should be simple and smooth-surfaced, easy to clean and disinfected between batches of birds. For example concrete asbestos and well-made wooden houses are satisfactory but thatch or earth floors can harbour disease.

An "all in all-out" policy should be adopted for each house, and young chickens should be reared at least 100 yards away from adult birds. The best housing system is to keep birds in wire-floored cages.

If this is not possible, make sure that the ground and litter are both clean and dry. Concrete floors are better than earth floors.

### SPACE REQUIREMENTS

Poultry kept on deep litter require the following living and feeding space for every 100 birds:-

Age in weeks	Feeding space	Drinkers	Square feet on litter
0 - 2	8 ft	One 9 - gallon drinker	20
2 - 4	16 ft		40
4 - 8	25 ft		60
8 - 12	33 ft	Two small round drinkers or one 4 ft. long	90
12 - 16	41 ft		120
16 - 20	50 ft		150
20 - weeks onwards	50 ft		300

Nest boxes should be provided at the rate of one 12 - inch square nest box for every five birds in lay.

Feeding space refers to one-sided troughs. A 6 ft long trough, which birds can reach from both sides, therefore counts as 12 ft. of feeding space. Troughs should be big enough to hold 1½ days supply of food when filled to the half-way mark.

Drinkers should either be connected to a piped water supply or else should be big enough to hold 1½ days supply of water. This will prevent water shortages which stop egg production very quickly.

Perches for birds on litter should be made of 2" x 2" wood and provided at the rate of 8 inches per adult bird. An alternative to perches is to use a weldmesh-covered droppings pit covering one third of the pen area for layers or half the pen area for growers. 2" x 1" weld mesh is fixed to removable wooden frames and placed 15 inches above the floor for growers or 24 inches above the floor for layers. By using this droppings pit, the litter is kept cleaner and the risk of disease is reduced.

When poultry are kept in cages, the stocking rate should be three adult birds in a cage 16 inches wide and 18 inches back to front. Birds reared in cages be allowed half a square foot each up to 16 weeks and four inches of feeding space per bird.

No more than 50 birds should be reared together in one cage. When birds are brooded in rearing cages,

the wire floor should be covered with hardboard or paper for the first week until the birds are able to walk on the wire. Sawdust, litter should be scattered on top of the paper.

### LIGHT AND TEMPERATURE CONTROL

Naturally-ventilated and naturally-lit poultry housing is very much cheaper than that depending on electric power. Production per bird is generally lower, but the return on capital invested should be higher because of the lower cost of the building.

There is no minimum size of unit and houses can be extended cheaply as the poultry unit grows. Poultry do not need bright lights to lay eggs. Indeed, too bright a light will cause feather pecking and cannibalism.

They should therefore be protected from direct sunlight. Birds give off heat and breathe out foul air. The ventilation system should remove both of these. Hot air rises, so an opening at the top of the building is necessary to let it escape while cooler air comes in through the sides.

Airflow round the birds themselves must be unobstructed, except in the case of young chicks which have to be protected from draughts. The stair-step arrangement of cages gives the best air circulation. Naturally-ventilated poultry houses must not be more than 30 ft wide.

Day-old chicks need warm dry and draughts-proof accommodation. Draughts can be prevented by using hard-board circular surrounds 2 ft. high, for the first week.

If the birds are reared on the floor, these surrounds are useful for keeping the chicks near the brooder. A circle, 5 ft. in diameter is sufficient for 100 chicks. The minimum brooder temperature necessary is:-

Age in weeks	0 - 1	1 - 2	2 - 3	3 - 4
Brooder temperature, degrees F.	95	88	81	74

From four weeks to point-of-lay, pullets are not too badly affected by either temperature or humidity. Maximum growth occurs at 60f., but the reduction in growth at higher temperatures is not important for pullets, provided the ventilation is adequate. Birds should be protected from the direct heat of the sun by a roof, extending well beyond the caves of the building.

Egg production is most efficient in temperatures between 50 and 70 degrees F. However, birds can produce well at higher temperatures provided the ventilation is satisfactory, the birds are acclimatised to them and the humidity is not also high.

In hot, dry climates, such as in the Kano area, water spraying during the hottest part of the day is useful in cooling the poultry house, but this should not be done in the humid areas of southern Nigeria.

X X X

## · MORE BIRDS FEWER EGGS

*Egg production falls when the stocking density of birds in cages raised or when colony size is increased, according to research in England.*

*In trials over four years at the Gleadthorpe experimental husbandry farm, Mansfield, Nottinghamshire, birds of two different strains were kept in cages of six different sizes,*

*ranging from 16 by 18 inches to 32 by 72.*

*Each of the cages was given two different stocking densities - 24 and 36 birds in the 32 by 72 inch cages, for instance - one usually being 50 per cent higher than the other.*

*Increasing the stocking density reduced feed consumption by about 2 percent and had an even greater influence on egg production. Egg numbers were cut by 3.3 per cent in the case of lightweight birds and as much as 5.4 per cent with birds of the heavier strains.*

*At both stock rates, production declined progressively as group size increased, with birds in the smallest groups of three and four birds per cage laying 10 per cent more eggs than those in the two largest groups of 24 and 36 birds per cage.*

*Egg cracks were 25 percent higher in the larger cages with little difference between the stocking rates. Group size did not affect mortality at the moderate stocking density: but at the high stocking density, mortality was 7.5 per cent in the smaller groups and 12.2 per cent in the larger groups.*

## HATCHABILITY UP BUT MYSTERIES REMAIN

Hatchability levels in the UK are the highest on record, according to Miss Susan Kirk, Scottish national poultry adviser.

Just 77 per cent of the 80 million hatching eggs placed in incubators in Scotland each year produce a chick, which is 10 per cent more than the level of 15 years ago.

But Miss Kirk believes there is still scope for further improvement.

Although modern incubation equipment has attained a very high standard of design and electronic control to meet the requirements of the developing embryos, there are still unaccountable differences in hatchability which appear to be tied up with treatment of the eggs during incubation.

Reasons for these differences are very elusive because most modern incubators are run with eggs at three or even more stages of development in the one cabinet and this complicates matters.

Miss Kirk believes that best hatching results can be obtained by regulating the incubator environment to suit eggs of one particular breed type, size, age and stage of development. This would mean the use of an all-in-all-out type of incubator.

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Research on banana in progress at the Tropical Products Institute, London.

A group of chemists at the Tropical Products Institute (TPI) and Chelsea College of Science and Technology in London are looking with interest at banana skins.

The banana already serves humanity well as a source of sugar, starch and minor proteins, to say nothing of banana oil. But if you are dealing with bananas in large quantities it becomes worthwhile to look for other things that might be extracted.

What the TPI (a department of Britain's Overseas Development Administration) considered at first was that banana skins might yield some of those drugs which have become so important in modern medicine, the steroids, for which at present the major sources are wild yams and sisal juice.

Research confirmed the presence of steroids — but only methylated steroids, for which there is no market. The medical use was put on one side but not forgotten. The day may come when methylated steroids are in demand.

The next stage is to look at some of these waxes for their physical properties and establish possible commercial applications. For developing countries especially the waxes open up an interesting prospect, as they would compete with some of the hydrocarbon waxes which all countries need for commercial applications.

In practice a great many hydrocarbon waxes are obtained from oil. The oil producing and refining countries are thus the main suppliers. For other

## Even banana skins may have their uses

by A. J. Arthur

countries hydrocarbons mean an extra item on the import bill.

### New Industries

Now, as a world oil shortage develops and other sources begin to look more attractive — and as prices begin to reflect that situation — the humble banana skin may get a new lease of life. Banana producing countries may be able to set up small industries to make furniture polish or shoe polish from what would otherwise be a waste byproduct. It would mean a saving of precious foreign exchange.

The extraction process would itself require petrol, but nearly all that petrol would be recoverable by recycling. The prospect is of a comprehensive banana industry producing ordinary bananas, dried bananas, banana flour, banana chips and commercial waxes.

Finally, the residue could still be used as fertiliser — and there would be positively nothing unsaleable left in the banana.

### Data Obtained

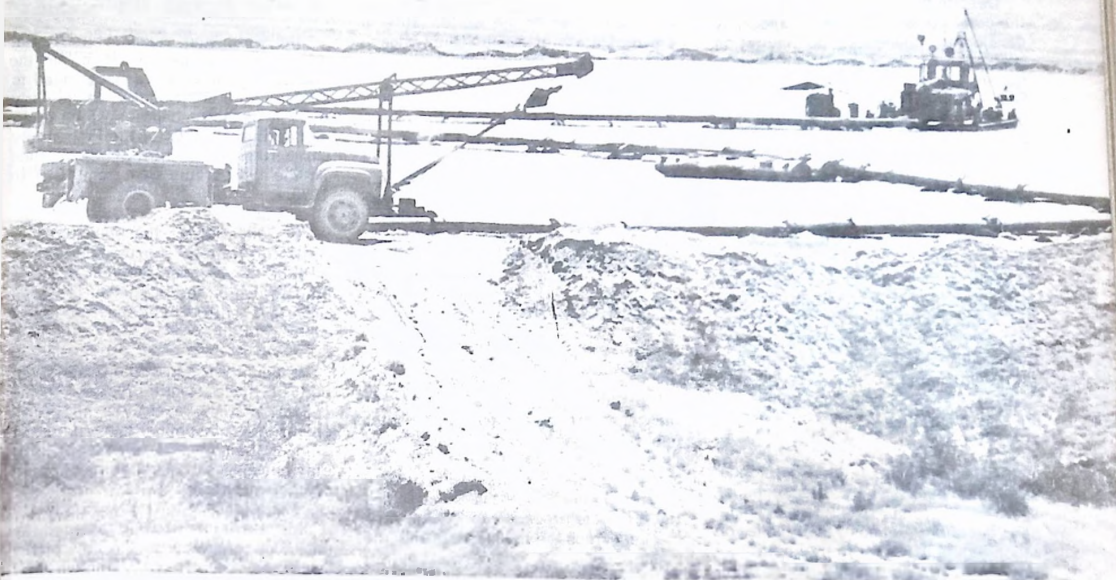
Meanwhile interest switched to the waxy quality of the banana skin. The scientists examined the wax content and composition and the changes in the wax during the ripening of the banana (since they are also interested in problems of storage).

Now they have much data on banana skin waxes, which are grouped as either hard or soft. Their composition varies a little, as does the quantity of wax in the different banana types.

## LAUGH

*A man in a booze managed to get to the door of his flat and for some time was fumbling with his key. It soon became obvious to the passer-by that he was having difficulty in opening the door.*

*One of them came to him and asked if he could be of help. "Yeah guy!" he said, "just hold the door to keep it steady, while I put the key into the key-hole".*



## THE LARGEST ARTIFICIAL RIVER IN THE WORLD

*One of the twelve suction dredgers silting the dam of the Kopetdag Reservoir on the Karakum Canal in Turkmenia.*

THE THIRD U.N. CONFERENCE ON THE LAW OF THE SEAS WAS OFFICIALLY OPENED IN NEW YORK LATE IN DECEMBER 1973. THE ITEMS ON THE AGENDA WAS, IN EFFECT, CONSIDERED IN THE COURSE OF ITS SECOND STATE, WHICH WAS HELD AT CARACAS, VENEZUELA, FROM JUNE 20 TO AUGUST 29, 1974. ANOTHER SESSION MIGHT BE CONVENED IN VIENNA IN 1975.

The Third UN Conference on the Law of the Sea is regarded as being among the most important international forums ever called by the United Nations. At its opening, H. Amerasinghe of Sri Lanka, who was elected Chairman, said that the Conference would be "one of the most important in the history of the United Nations and even in the history of international relations." There is good ground for such an assessment.

Indeed, in the history of international relations there have been no previous diplomatic meetings at which the countries of the world were so widely represented. Delegations of 148 countries took part in its work. It is noteworthy that the German Demo-

# Territorial waters and international law

by F. Kovalyov

cratic Republic and the Federal Republic of Germany, both of which recently joined the United Nations, attended the Conference on an equal footing.

The Korean also attended the Conference. Both countries were among the states which were not members of the United Nations but which were represented in its specialised agencies. The UN General Assembly sent

a special invitation to the Democratic Republic of Vietnam and the Republic of Guinea-Bissau, a newly-free African state.

## UNIVERSAL PRINCIPLES

Unfortunately, the principle of universality, that is, participation by all states without exception in the discus-

*continue overleaf*

sion of matters bearing on the interests of the entire international community has not been consistently applied even on this occasion.

Despite the insistence of the USSR, the other socialist countries and many developing countries, no invitation was sent to the Provisional Revolutionary Government of the Republic of South Vietnam, the Democratic Republic of Vietnam announced that it would be unable to attend the Conference.

The USSR delegation circulated a special document in New York, stressing support of the statement issued by the DRV Foreign Minister on November 22, 1973, to the effect that the Provisional Revolutionary Government of the Republic of South Vietnam "has full legal competence to participate in the work of all international conference and organisations affecting the destiny of nations", specifically the work of the Third UN Conference on the Law of the Sea.

The importance of the Conference was demonstrated by its agenda. There were dozens of acute and complex questions, almost every one of which required a separate international meeting for its solution. Indeed, this Conference was truly unprecedented in the number of questions that was tackled.

One need merely recall that the Second UN Conference on the Law of the Sea, held in Geneva in 1960, dealt with only one question—the width of territorial waters—which, incidentally, it did not resolve despite its efforts. At the Conference in view, the width of territorial waters was only one of many problems, even if it was of

of territorial waters was only one of many problems, even if it was of exceptional importance.

Nevertheless, the significance of the Third UN Conference on the Law of the Sea for present-day international relations did not depend on the number of states attending or the number of questions on its agenda.

Behind the dry term "law of the sea" lie some extremely acute problems bearing directly on the sovereignty and the economic, political and defence interests of all the countries of the world—developing and developed, maritime and land-locked.

Thus, the Conference had to work out the fundamental principles governing fisheries in the off-shore areas of the sea. The products of marine industries already play an important part in providing food for the population of many countries of the world. This is so, regardless of whether they engage in fisheries or import fish.

The share of marine products in the food balance of the population of the globe is bound to grow, but the resources of the World Ocean, as the latest studies have revealed, are not boundless. This underscores the importance for every country of establishing a system regulating fisheries, that would secure its current and future interests.

## RESOURCES ON THE SEABED

There is growing interest throughout the world in the energy and mineral resources of the seabed. Under the impact of the energy crisis, which has struck many countries, interest in these resources has sharply increased over the past few years. The UN Conference on the Law of the Sea also had to define the procedures for exploiting the resources of the seabed and the ocean floor.

The necessity to adopt measures of the seabed and the ocean floor. The necessity to adopt measures which would prevent further pollution of the marine environment and the need to combat such pollution were also problems that have become acute today.

Freedom of navigation in straits used for international shipping between various parts of the open sea is of exceptional importance for the entire international community. It is also an urgent matter in respect to maintenance and development of economic, commercial and other ties across the seas between all countries.

Meanwhile, some coastal states would like to do away with freedom of navigation in straits and establish a regime giving them unilateral advantages to the detriment of the interests of dozens of countries which, by virtue of their geographical location, are forced to use straits to maintain ties with other countries or, like the Soviet Union, to carry freight by sea between various parts of its own territory.

In view of the great economic political and strategic importance of the international straits, a key task before the UN Conference on the Law of the Sea was to ensure freedom of navigation in such straits.

The width and regime of territorial waters was a central item on the agenda. Some of its aspects need to be dealt with additionally, particularly in view of the tendencies which emerged during the work of the Preparatory Committee for the Third UN Conference on the Law of the Sea from 1970 to 1973.

The question of the boundaries of territorial waters (territorial sea) is part of the broader problem of state borders, which, as is known, is a very important matter in respect to interstate relations.

A country's territorial waters are part of the national property of the coastal state. Recently a number of countries have begun to declare the size of their overall territory in official handbooks as including the area of their territorial waters.

The decisions to be adopted by the UN Conference on the Law of the Sea with respect to the boundaries of territorial waters will, consequently, affect the size of states, the volume of their marine resources, and their security interests.

But in defining the boundaries of territorial waters it is not enough to be guided only by these factors and proceed from the assumption that the wider the territorial waters, the better for the coastal states. It is also necessary to consider the interests of freedom of navigation and other aspects of the legitimate use of the open sea by all the countries of the world.

After all, the increase of the width of territorial waters means the reduction of the area of the open sea which can be used by all nations and which plays a considerable role in the life of each country and of the entire international community.

## 50-YEAR STRUGGLE

For nearly 50 years, the USSR has been seeking to resolve the problem of territorial waters on the basis of comprehensive consideration of both the economic and security interests of

coastal states, and the interests of international shipping. World experience over a period of many years provides convincing evidence that the 12-mile strip of territorial waters best combines the interests of coastal states and those of the international community.

The Soviet Government expressed its support of the 12-mile limit in the early 1920s and has since then consistently worked for the establishment of this limit as a generally recognised rule of international law.

The First and Second UN Conferences on the Law of the Sea, held in Geneva in 1958 and 1960, were important milestones in this struggle. At these two conferences, the Soviet Union, the socialist and developing countries backed the 12-mile limit on territorial waters, while a group of states led by Britain, the USA, Japan and Canada sought to return to the 3-mile limit or at most a 6-mile limit for territorial waters.

However, by the time the Preparatory Committee for the Third UN Conference on the Law of the Sea was set up in 1970, the situation had undergone a substantial change. During the work of that committee, no delegation any longer insisted on the 3- or 6-mile limit. This forcefully demonstrated that those who favoured the 12-mile limit were on firm ground.

The adoption of a decision on the limit of territorial waters, which could have been effected within the framework of this committee (basing itself on the consensus principle), was resisted by a small group of countries which from 1950 to 1972 made unilateral claims to territorial waters with a width of up to 200 nautical miles. This group of states numbers less than 20.

China is one of the most active advocates of the 200-mile limit for territorial waters, but then she holds that even the 200-mile limit is inadequate. She declares that any coastal state is entitled to unilaterally extend its territorial waters within "reasonable limits", perhaps right up to the middle of the Pacific, the Atlantic or the Indian Oceans, if this appears to be "reasonable".

China's own territorial waters have a limit of 12 nautical miles under a law adopted in China in September 1958, that is, at the very height of

the diplomatic struggle to establish the 12-mile limit in international law. Today, Chinese spokesmen accuse the Soviet Union of allegedly trying to impose the 12-mile limit on other countries at the Geneva conferences of 1958 and 1960, while omitting to mention the fact that in 1958 China herself established a 12-mile limit for her territorial waters.

Behind the current Maoist tactics on the territorial-waters issue lurks, among other things, the desire to have a free hand just in case the Chinese leaders should wish to subsequently lay claim to parts of the open sea contiguous to China's coasts or to islands belonging to China or to which she lays claim.

The Maoists also regard the concept of extending territorial waters to within "reasonable limits" as a convenient instrument for achieving their far-reaching aims at the UN Conference on the Law of the Sea. Judging from the actions of the Chinese delegates, these objectives have nothing to do with helping to resolve the most complex problems facing the Conference.

The Maoists seek to utilise the Conference as a convenient arena for reviving their bankrupt concepts which characterise the contending forces on the international scene as divided along the lines of the "world city" and the "world village". Chinese diplomats have tried to use the particular attitudes of some developing countries in respect to the law of the sea in order to organise, and, if possible, to lead, a bloc of "poor countries" against "one or two superpowers".

What is more, as speeches by Chinese representatives on the territorial-waters question have shown, the brunt of their attacks is aimed above all against the Soviet Union and the other socialist countries. But China's present attitude towards problems concerning the law of the sea objectively clashes with the vital interests of the overwhelming majority of states, including the developing countries. This is so, because China's attitude encourages arbitrary and unilateral acts in international affairs and helps to undermine the principles of international law.

Some states which lay claim to more or less extensive areas of the

open sea and those which share their stand deny the existence in international law of a generally binding rule limiting the width of the territorial sea to a maximum distance of 12 miles from the coast.

They assert that the only contractual basis for legal regulation in this sphere is provided by the 1958 Geneva Conventions on the Territorial Sea and the Contiguous Zone, and on the Open Sea, whose participants by now include, respectively, 42 and 54 countries of the 148 states to be represented at the Third UN Conference on the Law of the Sea.

They hold that the provisions of both Geneva Conventions of 1958, including those indirectly confirming the unlawfulness of extending the boundaries of territorial waters beyond the 12-mile limit, may be regarded as being binding only on the participants in these Conventions but cannot be binding on states which have not acceded to them.

Such arguments cannot in any sense be regarded as having any substance: while there is no contractual rule on this matter that is binding on all countries, this does not at all mean that there is altogether no generally binding rule in international law establishing the unlawfulness of claims by states to an extension of their territorial waters beyond the 12-mile limit.

There is, in fact, such a rule in international law, it is the rule in customary law (international usage), which took shape in the late 1950s and which is binding on every state, regardless of whether or not it was a participant in the 1958 Geneva Conventions.

## COASTAL CHIEFS

There are now 119 countries with sea coasts, and 100 of them have legislation on the territorial sea which does not exceed the 12-mile limit. Almost every unilateral declaration on the extension of territorial waters beyond the 12-mile limit has drawn objections from other states, which regard this as a breach of established international usage. Thus, the limitation of territorial waters to a maximum of 12 miles is widely recognised.

An authoritative agency like the Commission on International Law,

*continue on page 21*

## Farmer of the month

Perhaps the main attraction to any business is the opportunity of making money readily. A few in dustries exist, however, wherein investing money alone does not produce the desired result which is usually guaranteed in some industries from the moment money is invested.

Truly, the more risky a venture, the higher the profit, but some industries call for more than monetary investment, such industries demand both wit and personal interest. And unless the interest is there other than the profit motive disillusion will ruin the whole business untimely. One such industry is poultry.

And one fellow who has not gone into the industry for what he can scoop out of it is Chief Emmanuel Oladapo Ladebu - Adebaki, 55, eldest son of an Egba polygamous family at Opeyeka village near Ifo, Western State. Already a king businessman by 1967 when he went into poultry Chief E.O. Ladebu - Adebaki could have continued a happy - go - lucky life when his Western Hotel, Agege Motor Road, Mushin, was already a success, his Ladebu Builders and Transport Service also thriving and a chatel of buildings to buttress his financial empire but sheer interest first lulled him, then good results encouraged him until now precisely eight years from the first peep, the chief is



Miss Ladebu - Adebaki, already a College graduate, checks the incubator for temperature and humidity, to ensure a good hatch.

# CHIEF E. O. LADEBU

## The Poultry King of Opeyeka

ten each doing a full day's job since the chief keeps a 24 hour surveillance so to say.

An initial batch of 300 day old pullets - a backyard experiment has become an octopoid business. In eight years, what a record? The head office is at 133, Isheri Road, Ikeja with the insignia - LADEBU POULTRY FARMS LTD boldly written on a sign-board at the gate.

### Early life

Young Ladapo, his pet name, began his elementary education at Okenla C.M.S. School, Ifo, in 1928 and entered the Baptist Boys High School in 1933 to come out with flying colours in 1935 and skipped the Senior Cambridge School Certificate at an age when holders of such a qualification could be counted in Nigeria.

He then had a brief spell of ten years (1940 - 50) as a Civil Servant in the Meteorological Department as a Meteorological Observer. "I was working in the close confinement of a routine job while my innate self wanted something more exacting and equally rewarding", the chief recalled; so he left the Civil Service and joined the Leventis Group of Companies. His point of entry was at Ibadan as a clerk.

Ten years in the Civil Service, where mediocrity is rewarding, are

**'Tatum birds  
compare well  
with any other  
breed'**

# BU-ADEBAKI

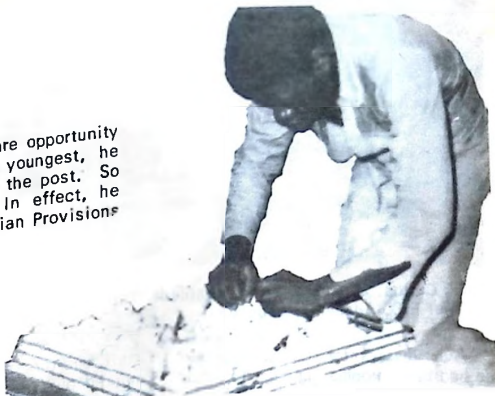
ge, Ifo.

st insufficient to change a good  
orker into an aloof and uninterested  
rker but Ladapo maintained his  
ounds and soon showed grit and  
ilience in his new working place -  
private trading firm like any other  
here privileges were few or un-  
nown but where one had to work for  
ne's post. A challenge came when  
the Company wanted to launch a  
pioneer Nigerian Managership Train-  
ing Scheme.

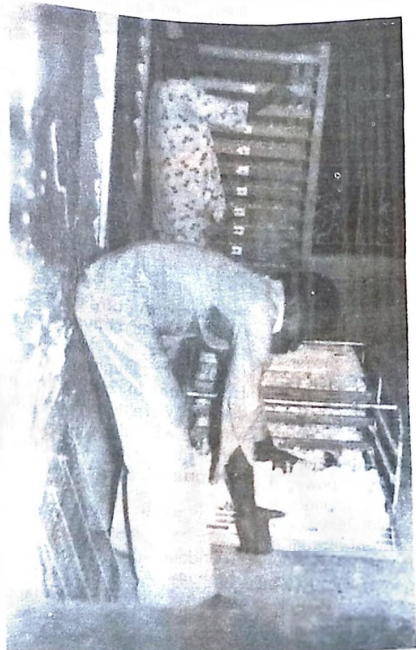
Venturesome Ladapo, barely nine  
months in the company offered to  
compete in the search for a manager -

in - training, a very rare opportunity  
then but though the youngest, he  
emerged the winner of the post. So  
to Lagos he came. In effect, he  
became the first Nigerian Provisions  
Manager.

## DAY-OLD CHICKS



Sorting, sexing and counting are done with quick despatch by a trained hatchery - hand



Day - olds arriving.

by **Abiodun Ojugbele**  
Managing Editor: Farmstock

For day-old



# TATUM BROILERS

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Mr. Carlos M. Kinsey Vice President, Tatum Farms, U.S.A. squatting, inspects the birds at Opeyeka Farms with Chief E.O. Adebaki - Ladebu.

Five years later, Ladapo decided he had been groomed enough to pitch his wits against private business so he set up a provisions shop, a very correct step bearing in mind his experience under his last employer. Business was brisk and encouraging, eventually he established the Western Hotel and successively a string of other businesses.

Now a Holding Company - Ladebu Group of Companies Limited - with him as the Chairman/Managing Director manages the various arms of business including the poultry which perfunctorily demands more of the Chief's attention than any of his other ventures.

### TATUM BIRDS

Chief Ladebu had a short spell of business with Honegger birds, but is now on Tatum. His poultry business has gradually moved from raising layers for table eggs to hatching. Day - old chicks are now obtainable from Ladebu Farms every Monday. The birds are hatched by a 'Western 19' incubator, cabinet type.

Ladebu's market for chicks covers the whole of Western State and a steady build - up of parent stock and other ancillary services is going on at Opeyeka Village on a 185 acre farmland.

At Opeyeka, a small industrial village has been set up. For a start, ten poultry pens each roughly 10m x 16m, have been constructed; there is also a bungalow for the Director,

staff quarters and roads have been marked out and the hatchery already completed.

In between the hatchery and the pens, there is a vast space enough for four football fields. 'I shall soon buy some tractors', the chief confided in me. Electrical power was the main set back at Opeyeka Poultry Farm. For sometime, a generator was used to supply power to the incubators and houses and life at Opeyeka was all smiles but the supply was unsatisfactory and unsteady thereby causing untold hardship and losses - incubated eggs or birds just hatching etc.

In brief, electricity is the panacea of the industrial setback at Opeyeka. The incubator has been transferred to Ikeja which in effect means low production. 'We would have been producing about ten times our present rate' lamented the Chief.

It is noteworthy that Opeyeka near Abalabi is midway between Papalanto on the Lagos - Abeokuta road and Ilaro, both places having electricity and just about twenty five kilometers apart. If Papalanto and Ilaro are linked by power lines then Opeyeka will have electrical power and life will boom there once more

At the time of my visit to Opeyeka Farms, the Vice-President of Tatum Farms U.S.A. - Mr. Carlos M. Kinsey - was also there. He had been consulting with Mr. Ladebu - Adebaki on a number of issues to improve the image of Tatum in the country. We had quite an interesting chat together as I boasted about the mammoth agricultural plans the

country has at hand.

Ladebu Poultry Farm confines itself to hatching in order not to compete with its customers in the sale of table eggs and chicks (broilers). But recent escalating prices of feed which have sent many an egg producer packing have brought some hatchers including Ladebu to undertaking the production of table eggs on contract.

This explains why many are turned back even when they see eggs stacked high at the head office. 'They are bought up'. The Chief told me: 'Tatum birds have good food conversion ratio, they are hardy, which means they are less susceptible to many diseases, hence mortality is low, they lay brown eggs with thick shells and high hatchability; the eggs are less brittle and above all, the birds are quiet.

Their feed conversion is so good that in seven weeks the chicks are ready for slaughter at an average live-weight of 2 kilo and an average dressed weight of 1.2 kilo. This is why I am still in business and pumping more cash into the whole enterprises', the Chief informed me.

### FAMILY INVOLVEMENT

Undoubtedly Chief Emmanuel O. Ladebu - Adebaki is a lucky man since his children have much interest in their father's business and have shown serious concern about it mentally and physically too. The Chief has a good crop of children;

*continue on page 23*

## TERRITORIAL WATERS AND INTERNATIONAL LAW

which now includes 25 leading specialists on international law representing all the principal law systems, declared back in 1956 that "international law does not permit an extension of the territorial sea beyond 12 miles".

Its comments on the draft Convention on the Territorial Sea noted that the Commission quite definitely went on record as opposing claims for the extension of the territorial sea to limits which, in its opinion, jeopardise the principle regulating the law of the sea since Grotius, namely, freedom of the open sea.

The 1958 Convention on the Territorial Sea and the Contiguous Zone says nothing explicitly about a 12-mile limit, but not because the participants in the 1958 Geneva Conference allowed for the possibility of establishing wider limits (at the Conference, the Salvador delegation was alone in insisting on the 200-mile limit).

What was discussed at the Conference was not whether territorial waters could be extended beyond the 12-mile limit, but whether the limit should be of three, six or twelve miles.

The fact that the overwhelming majority of the 1958 Conferences were countries favouring three, six or twelve miles territorial waters is reflected in the Convention on the Territorial Sea and the Contiguous Zone. Under the Convention, states are vested with definite powers within the zone of the open sea "contiguous to its territorial sea" (Point 1, Article 24), while Point 2 of the same Article states: "The contiguous zone may not extend beyond 12 miles from the baseline from which the breadth of the territorial sea is measured."

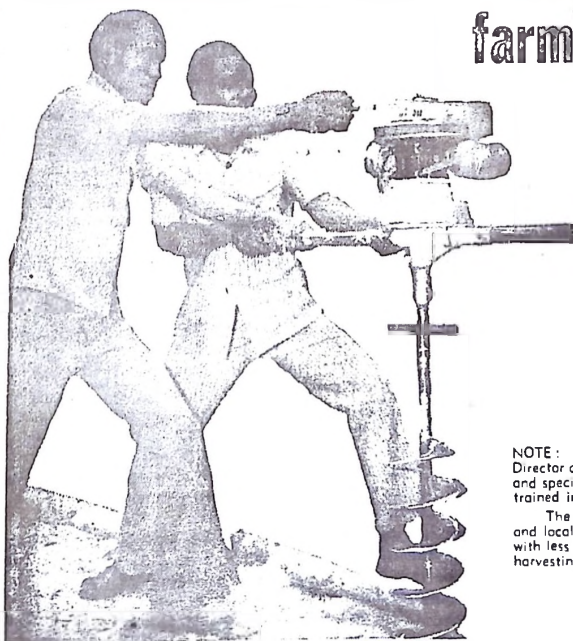
Clearly, where such a zone is contiguous to the territorial sea and may not simultaneously extend beyond the 12-mile limit off shore, the territorial

sea itself can never extend beyond the 12-mile limit. What is more, Article 2 of the 1958 Geneva Convention on the Open Sea says that the open sea shall be open to all nations, and no state has the right to claim subordination of any part of it to its sovereignty.

The Commission on International Law, which drafted the 1958 Geneva Conventions, stressed in its documents that the Conventions embodied rules already operating in international customary law, which are binding on all states, regardless of international treaties.

The incorporation of the above-mentioned provisions into the Geneva Conventions shows that these reflect generally binding rules of customary

*continue on page 22*



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NOTE: This technical development was projected by the Managing Director of BIFCO Limited, Mr Godwin Sk. Ukey the Conqueror. An engineer and specialist on research in mechanical/refrigeration equipment. Mr Ukey trained in Western Germany.

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## TERRITORIAL WATERS AND INTERNATIONAL LAW

law which had existed prior to and independently of the Conventions. Unilateral acts in fixing boundaries for territorial waters 200 miles off shore are a breach of the generally binding 12-mile rule and should be qualified as unlawful.

### CONTRACTUAL RULE

Of course, international usage differs from contractual rules, whether of international law or convention. Thus, the concrete legal content of custom is not always obvious; from time to time the very existence of a particular customary-law rule is contested.

This explains why the Soviet Union and many other countries attach such importance to establishing in international conventions and treaties customary-law rules, including the customary-law rules of the international law of the sea.

Still, if work on such contractual formalisation of customary law rules (or their codification) has yet to be completed, and the existence of a customary-law rule has been proved, it is as binding on states as contractual rule.

Countries refusing to be guided by the 12-mile rule and which have unilaterally laid claim to 200-mile territorial waters sometimes refer to the fact that in the early 1920s the Soviet Union itself advocated 12-mile territorial waters, ignoring the 3-mile principle then allegedly generally recognised.

There is no ground for such assertions because in the early 1920s there was no single generally recognised rule in international law defining the maximum territorial-waters limits. Thus, with a relatively small number of states then taking an active part in

shaping international law, an entire regional group—the Scandinavian countries—refused to recognise the 3-mile principle and long held to the 3-nautical mile limit. At the 1921 Conference at Geneva on the Aland

Islands question, the Italian delegate declared: "There are no general, universally recognised principles in international law on the boundaries of territorial waters, which the state is free to determine of its own accord."

In view of the existing situation, the Soviet Government had good ground to declare at the time that "neither the theory of international law nor the practice of international relations has established a definite limit for territorial waters" and that "the 3-mile strip is not at present generally recognised."

The generally binding customary-law 12-mile rule as the maximum permissible limit for territorial waters took shape roughly 35 years later, when territorial waters of that width were established by dozens of states and when it was generally recognised that extension of territorial waters beyond that limit would amount to an attempt to subject the open sea to the power of individual coastal states.

### ENCROACHMENT ON BASIC PRINCIPLES

Some of those who now advocate the extension of the sovereignty of states to areas of the open sea to a distance of 200 miles seek not only to eliminate the 12-mile rule but also to upset the very division of marine spaces into territorial waters and the open sea.

It is proposed that this division, which has been firmly established and which has justified itself in international practice over the centuries, should give way to a division into "national sea" and "international marine space". These proposals amount to more than an innocuous juggling of terms.

Indeed, it is, in effect, an encroachment on the basic principles of the law of the sea; the territorial-water regime and the basic freedoms of the open sea—freedom of navigation, freedom of overflight, freedom of fishing, freedom of laying cables and pipelines, and freedom of research,

The legal regime of territorial waters differs from the regime of land and air territory of states in that, in accordance with international law, the right of so-called innocent passage across territorial waters is recognised for foreign merchant ships. This kind of regime for territorial waters in conjunction with freedom of navigation in international straits is necessary for the unhindered development of international shipping and for the ensurance of uninterrupted sea links between all the countries of the world.

It is not "granted" by an expression of will on the part of the coastal state, but established in accordance with international law and, consequently, cannot be unilaterally abolished.

Should the "territorial waters" concept, which is firmly established in practice and in international law, be replaced by the "national sea" concept, the institution of "innocent passage" across territorial waters outside straits could then be scrapped. In that event, foreign navigation in "national seas" would be carried out not in accordance with the principle of "innocent passage" recognised in international law, but in accordance with the "right of transit" granted by coastal states who would be in a position unilaterally to annul it or entirely to regulate its use.

As for the idea of substituting the concept of "international marine space" for "open sea", the aims of those who advocate this change are even more transparent: they want to

## DEVELOPING COUNTRIES: PROBLEMS

continued from page 20

# LADEBU

three of the eight are overseas in Maryland U.S.A.

The eldest, a girl, is already a graduate in Agriculture; she holds a major in Poultry Science. Bose another girl, is doing Industrial Relations and Soji who left Nigeria with his sister, Bose, in 1973, is doing Business Administration and Accountancy in Bowie State University, Maryland. Soon to join the team is Mr. F.A. Ladebu - Adebaki who has just finished College and hopes to enter Maryland University, next year.

'By the time these four are back I shall retire into the hinterland says the Chief whose Transport Company covers the transit service between Opeyeka and Lagos when vehicles allocated to the poultry section are insufficient to cope with the errands.

### LEGACY

'Did you inherit your wealth, Sir?' I nosingly asked the Chief. 'No please' was his cute reply. Added he: My parents, both octogenarians now, are still alive.' How can I inherit from a living person? My father educated me and I go into the world. My education is my inheritance.

I was trained by the Baptists. They taught me to be self-reliant, hard-working and to wait for results. I do not smoke.'

If you do not see the Chief, he may be in the United States where he goes frequently to consult with his partners - TATUM FARMS are from America - and take some time off to see the young Ladebu - Adebakis. Chief E.O. Ladebu - Adebaki is a practising Christian, he holds to the norms of his faith well and he is a socialite.

He is one of the trustees of the Christ Apostolic Mission of Nigeria and holds the Missions's highest chieftaincy title of the Balogun of the Mission.

eliminate the freedom of the open sea and to establish a regime allowing states to dictate the procedures governing the use of marine spaces through some supranational agency.

The attempts to overthrow the 12-mile limit for territorial waters and the traditional division of marine spaces into territorial waters and open sea are quite often presented as a "forward-looking and revolutionary" approach to problems of international law, while the advocates of the traditional principles are accused of being "conservative".

Here, the greatest zeal has been displayed by Chinese diplomacy, which has attacked the stand taken by the Soviet Union and other socialist countries on the law of the sea.

At the 5th session of the Preparatory Committee for the Third UN Conference on the Law of the Sea, held in April, 1973, the Soviet delegate stated that the Soviet Union, true to its revolutionary and democratic traditions, had been working against all the obsolete and reactionary elements in international relations and for the triumph of new principles of peace, security, welfare and progress of nations.

But the Soviet Union did not identify the progressive democratic-revolutionary approach to international problems with the desire to abolish everything that was of historical and practical value for the nations of the world. The territorial-waters concept, based on the idea of coastal states extending their sovereignty to the territorial sea and the airspace above it, together with the surface and the subsoil of the bed, was in line with the present objective requirements of states.

The formulation of this concept "has been accompanied by the simultaneous recognition of the right of innocent passage of foreign trading vessels throughout territorial waters, a right established in the interests of safety of international navigation and of the development of peaceful relations among states."

Many developing countries, adhering in their legislation and practice to the 12-mile limit for territorial waters, have announced their readiness to support the establishment of this limit as a contractual rule by the Third UN Conference on the Law of the Sea. At the same time, they want the Conference to adopt decisions protecting their fisheries interests in off-shore zones of the sea.

The Soviet Union has always taken an understanding view of the concern of the developing countries for the rational use of their fish resources in marine areas contiguous to their coasts. An aide memoire annexed to a draft article on fisheries, which the Soviet Union presented in the Preparatory Committee for the UN Conference on the Law of the Sea in July 1972, stressed: "Due to the prolonged colonial exploitation to which they have been subjected, the developing countries possess far less economic and technical means for fishing than the developed states possessing distant-water fishing vessels."

That is why the USSR considers it necessary to take into consideration the fishing rights of developing coastal states in areas of the open sea directly contiguous to their territorial waters.

The Soviet Union wants the problems relating to fishing to be solved on the basis of a reasonable combination of the interests of developing coastal states and the interests of all the other countries, including those engaged in expeditionary fishing and countries without any sea coast.

Broad support by participants in the Conference of the proposal to establish the 12-mile limit for territorial waters in the new international convention on the law of the sea would undoubtedly help to achieve an understanding on the problems of fishing in off-shore zones. This would help to solve the problem which the First and the Second UN Conferences on the Law of the Sea had, regrettably, been unable to resolve, a problem which has been creating many difficulties for the development of equitable international cooperation.

# What the COOP Signifies

by A Special Correspondent



A small flock like this above can become multiples of it through cooperative help.

A common thread runs through all these examples of community cooperation. It is that people can own and operate their own self-service ventures, if enough of them have a common need and feel it strongly enough to act to meet it.

Groups of people or sponsors can form cooperatives much as they would form any voluntary association or club for a worthwhile purpose.

But more than money is involved. In cooperatives, as in any voluntary effort, people's planning, time, and effort are needed. No cooperative — or any other business — succeeds unless people need it, work at it, finance it adequately, and employ the technical help required to manage it well.

Many cooperatives that have overlooked this latter principle have failed.

## THE AIM OF A COOPERATIVE

But while a cooperative assumes the risks and uncertainties of any business enterprise, the reason for its existence is quite different. A co-op is created out of people's joint needs in order to serve those who use it and any others who want to share in that use — not to make money for investors.

After making their initial investment, the family in our example were able to buy their cooperative apartment at a monthly cost considerably below the amount they would have

paid to rent a similar apartment.

This was possible because the co-op's purpose was to give the greatest value for the homeowner's dollar. The co-op members' money was being invested to obtain housing for the members, not to earn dividends for an investor or real estate speculator.

The latter might have been interested in economizing on room size, site planning, and other essential details, and in any even would have had to price the development high enough to cover any loss.

Similarly, the credit union to which this family belonged was formed to meet the plant employees' needs for a place to save regularly and to borrow at low interest. It was not formed to make money by lending it.

Thus, a cooperative is an enterprise enabling individuals, institutions, or families to do together what none could do alone — and to reserve for the members decisions affecting the price, quality, and service features of what they buy together.

In these respects the purpose of a cooperative doesn't differ from that of any mutually beneficial undertaking organized by a group of people or institutions. Through the United Nations, for example, nations cooperate to maintain peace and fight poverty and disease.

## ONE MEMBER, ONE VOTE

Most cooperatives operate on basic principles developed more than 125 years ago in Rochdale, England, when poverty-stricken weavers opened the first consumer-owned store.

The first of these is open membership. Cooperatives have no membership restrictions of class, creed, colour, or conviction.

Second, each member-owner has only one vote, regardless of the number of shares he owns.

Third, invested capital receives only a limited return.

The fourth principle is the patronage refund. Service is provided at cost, and prevailing price levels are maintained. What remains after all costs are met and reserves provided for is distributed to users of the service in proportion to their use.

Cooperatives also stress the wisdom of cash trading, where feasible, and the need for constant expansion and education.

Unless members understand what they own and are encouraged to use and invest in their business and elect competent officials, their cooperatives may fail. Above all, elected boards need to hire efficient management personnel.

# Agriculture for schools

In order to help students preparing for examinations in Agriculture, we publish below this year's syllabus for the West African School Certificate at both Ordinary and Advance Levels.

## WEST AFRICAN SCHOOL CERTIFICATE & G.C.E SYLLABUS

### AGRICULTURAL SCIENCE (ORDINARY LEVEL)

*Candidates can be accepted for this subject only in accordance with regulations G.A(2), 1(3) and 5(3).*

#### COOPERATIVES

Cooperatives comprise one of the largest businesses in the British Isles, in Israel, and in much of Scandinavia, and are prominent throughout western Europe and Japan. In Tanzania the Ujamaa is on the same principles applied to farming. Various forms of cooperatives are growing tremendously in Africa and are becoming more and more important in Latin America.

Not all cooperatives apply all of these principles, but they have been

Not all cooperatives apply all of these principles, but they have been

Not all cooperatives apply all of these principles, but they have been basic to the success of co-ops for more than a century.

In the non-Communist countries more than 100 million families participate in cooperatives. In North America cooperatives account for perhaps two or three per cent of all business but a much higher percentage

business but a much higher percentage than that in many individual lines, especially among farm families and in consumer credit.

The Science syllabuses have been prepared on the assumption that the course will be based on practical work, and considerable weight is given, in the marking schemes, to the practical examinations. In order to ensure that passes in Science subjects are not awarded to students whose knowledge is obtained from books alone, no school may enter candidates in any Science subject unless it has been specifically recognized for that subject by the appropriate Ministry of Education. The Council reserves the right to inspect such schools. The Council does not attempt to prescribe a course of experimental work or even the number of periods to be spent in carrying out experiments since it does not wish to interfere with the freedom of schools in these matters. Candidates who have left school not more than a year before the date of the examination may be permitted by the Head of the school, at his discretion, to enter as school candidates.

4(3)

Schools seeking recognition for a specific Science subject (or subjects) must apply to the appropriate Ministry of Education for such recognition by 30 June, two years before the examination for which recognition is sought.

AND 5(3)

Private candidates can be accepted for Agricultural Science, Biology, Chemistry, General Science, General Science (Additional) and Physics only

if (i) they have spent three years at a school recognized for these subjects, and (ii) they produce, when they enter, a certificate from the Head of their former school establishing this fact and stating that the Head is prepared to offer laboratory facilities during the examination.

Candidates offering Agricultural Science will be required to offer, in addition, General Science or Biology and Chemistry.

When Agricultural Science is taken together with General Science or Biology and Chemistry at the same examination, a pass may be awarded in Agricultural Science irrespective of the candidate's performance in General Science or Biology and Chemistry.

There will be three papers all of which must be taken:

PAPER 1 will be a 1½ hour practical paper.

PAPER 2 will be a 1 hour theory (objective) paper.

PAPER 3 will be a 2 hour written paper consisting of four sections.

There will be three questions in section A two in each of the remaining three sections B, C & D.

Practical work should form the basis of preparing for this subject. Candidates will be required to submit their PRACTICAL FIELD NOTEBOOKS for which marks will be awarded.

*continue on page 26*

## DETAILED SYLLABUS

Candidates will be expected to answer questions on the topics set out in the column headed 'Syllabus'. The rates are intended to indicate the scope of the questions which will be set but are not to be considered as an exhaustive list of limitations and illustrations.

It is desirable that schools presenting candidates for Agricultural Science should keep a School Farm, but where this is not possible, a well planned garden with small plots of farm crops of regular observation during growth is essential. At least two species of livestock, preferably one monogastic e.g. pigs, poultry, and one ruminant e.g., sheep, goat, cattle or a herbivore e.g. rabbit, guinea-pigs must be kept. The Practical Field Note Books of the candidates should contain records of individual projects, farm activities and observations carried out on the school farm or garden.

It is also recommended that the study of Agricultural Science in the School Campus be supplemented by visits to well organized farms and/or Agricultural Research Stations.

### SECTION A: INTRODUCTION TO AGRICULTURE

#### SYLLABUS

1. The meaning and importance of Agriculture.

*This should involve a discussion of the importance of Agriculture to man generally and its role in the economy of the relevant West African country, emphasizing that agriculture is a business.*

2. General principles of land use.

*This should be discussed in relation to the use of land for Agriculture, Forestry and wild life conservation purposes, bearing in mind the physical, economic and social factors, commercialisation, communication and marketing.*

3. Agricultural Systems: land tenure problems; shifting cultivation; crop rotation; continuous cropping; monocropping, mixed-cropping, pastoral and mixed farming.

4. Development of Agriculture: role of science and technology in development of Agriculture, including tools and source of farm power, Problems of development of local Agriculture.

Role of Government-Agricultural policies, regulations and programmes. Agricultural education, research and extension, credit facilities, subsidies, quarantine, vaccines and farm settlement schemes.

5. Simple farm tools and Agricultural machinery: their uses and maintenance.

*Engineering details should be avoided.*

6. An elementary study of climate with particular reference to its effects on Agriculture. The main types and ecological distribution of crops (cereals, legumes, roots, vegetables, edible fruits, beverages, spices, drugs, oils, gums, latex, fibre); and animals (cattle, sheep, poultry, rabbits) found in West African countries.

7. Use of Agricultural and Forest products and their by-products.

*The discussion should include the use of agricultural and forest products for the provision of*

- (1) Food: fresh and processed;
- (2) Clothing: hides and skins, fibre, rubber etc.,
- (3) Shelter: Timber, gums, resins, etc.
- (4) Health: Drugs;
- (5) Fuel and Power: oil, minerals; and
- (6) Others.

### SECTION B: SOIL SCIENCE

1. Soil formation and properties: rocks-main types, rock weathering and factors of soil formation. Composition and properties of the soil, sand, silt, clay, organic matter; soil acidity. Soil texture and structure, and their importance. Water-retaining properties of humus and clay.

*Different soil types should be handled and the separation of a soil into sand, silt and clay fractions demonstrated. Water-holding capacity and drainage of a sandy soil, clay and soil with a high percentage of organic matter should be simply demonstrated by these soils in funnels.*

2. Soil and water conservation: depletion of soil resources by leaching, cropping, burning and oxidation of organic matter; erosion—its importance, causes, prevention and control—irrigation and drainage.

3. Soil fertility: plant nutrients, major sources of nitrogen, phosphorus and potassium. Maintenance of soil fertility; crop rotations, including cover crops and green manure, the living population of the soil and

its role in the carbon cycle (especially Earth-worm and Termite) and nitrogen cycle (especially nitrogen fixing bacteria); the use of commercial fertilizers and lime, the principles and practice of cultivation and their effects on soils.

## SECTION C: CROP SCIENCE

1. A review (with emphasis on their Agricultural implications) of plant parts, their functions, growth, development and reproduction.

2. Annual and perennial crop plants: external morphology, life-history, propagation, growth, cultivation, harvesting, storage, marketing and uses of local crop plants. Minimum of two

crops from each of groups 1 to 6 should be selected from the list in the Appendix table below.

*Where there are two or more types in each group not more than one member of each type should be studied.*

3. Pastures and forage crops; recognition and study of main grasses and legume species commonly used in pastures. Natural pastures and their distribution. Important forage grasses and legumes and their uses.

*Detailed botanical studies are not required. Students will be expected to recognize on the basis of gross morphological appearance, at most for species of grasses and at least one species of legume used in pastures.*

4. Crop improvement: aims, methods, introduction, selection and cross-breeding.

*Chromosomes and Mendel's 'Laws' need not be treated in detail. A brief study of sexual and asexual methods of crop improvement. A comparison of a local variety and an improved variety of a crop plant can be made for demonstration.*

5. Weeds: their importance in Agriculture. Recognition of common annual and perennial weeds of local importance. Methods of dispersal and control of weeds.

*Herbicides can be mentioned but not details of chemical structure and mode of physiological action should be dealt with.*

6. Disease: a simple general account of diseases caused by fungi, bacteria, nematodes and viruses and nutrient deficiencies affecting crops. The nature of the damage, methods of transmission and common methods of control.

*Microscopic recognition of the causal organisms may be demonstrated where feasible.*

7. Pests: a general account of pests of crop plants and stored products, their types and importance; principles and methods of pest control.

*Study should include a general account of pests including rodents, birds and insects. An account should also be given of the life-cycle of a biting insect, e.g. grasshopper, a boring insect, e.g. a weevil, a sucking insect, e.g. an aphid.*

## SECTION D: ANIMAL SCIENCE

1. A review (with emphasis on the Agriculture implications) of the organs and tissue of animals and their functions.

*A discussion of various species of domestic animals, their uses, and the common breeds (exotic and local) of each of the species.*

2. Farm Animals: purposes of their production. Types and economic value of domestic animals locally produced.

3. Elementary study of Animal Nutrition: Functions of carbohydrates, fats, proteins, minerals and vitamins. Feeding stuffs—sources of main nutrients; balanced rations; maintenance and production rations; malnutrition in farm animals.

*Details of formulation of diets and bio-chemical details of these major nutrients are not required.*

4. Reproduction in farm animals; heat period (oestrus); a general outline of the development, nourishment, respiration and birth of the young. Mammary glands; milk; lactation; egg formation; weaning of young.

*Details of cell division and of the anatomy of the early embryo and the formation of the foetal membranes are not required.*

5. Study of one animal from each of the following groups; study including the main aspects of general management, feeding and breeding.

- (a) cattle, sheep and goats;
- (b) pigs, rats, and dogs;
- (c) rabbits, guinea-pigs, horses and donkeys;
- (d) chicken, ducks, turkey, guinea-fowl.

6. Animal improvement: aims, methods: introduction, selection and cross-breeding (including the use of artificial insemination).

*Chromosomes and Mendel's 'Laws' need not be treated in detail. Comparison of a local breed and an improved breed of animal can be made for demonstration purposes.*

7. Diseases: a general account of important diseases in farm animals. Control: preventive and remedial measures.

*Local examples should be emphasized.*

8. Pests and parasites: insects and ticks and carriers of disease in farm animals. Life-history of one endoparasite of farm animals, e.g. ticks or lice. The principles and methods of control of pests and parasites of farm animals.

*Details of structure are not required.*

## APPENDIX TABLE

List of annual and perennial crops (See SECTION C. 1.2 of Syllabus).

- Group 1: Cereals: maize, millet, rice, guinea corn, wheat, tamba, acha.
- Group 2: Legumes: beans, cow peas, groundnuts, soya beans, bambaragroundnuts, yams, beans, pigeon pea.
- Group 3: Roots, tubers and vegetables: cassava, yams, cocoyams, potatoës, onion, charlots, pumpkins, tomatoes, carrots, okro, spinach, vegetable jute, lettuce, cabbage, cauliflower.
- Group 4: Edible fruits and nuts: avocado pear; bananas, citrus fruits, guavas, mango, jackfruit, pawpaw, pineapple, cashew, watermelon.
- Group 5: Beverages, spices and drugs: cocoa, coffee, colanut, peppers, benni-seed, ginger, sugar-cane.
- Group 6: Oils, latex and fibres: coconut, cotton, oil palm, shea butter sun-flower, sesame, rubber, sisal, kapok, jute, hemp.

## PRACTICAL AGRICULTURAL SCIENCE

One hour and a half will be allowed for the practical test which can be taken in an ordinary classroom. The principal aim will be to test skill in observation and recognition. The practical note book covering the work of the entire syllabus, field work farm diary and project work will be examined and assessed.

NOTE: It is assumed that candidates will have gained adequate experience of every practical aspect of the entire syllabus.

1. Soil samples, rocks, and fertilizers.

*Soil samples to be examined for texture by feel only, acidity by simple tests. Common rock types of igneous, metamorphic and sedimentary origin. Soil profile description. Recognition of common types of fertilizers and manures.*

2. Growth, habitat and form of plants and animals studied as listed in Appendix Table (Groups 1 to 6) and sub-section 5 of Section D of the syllabus.

*Recognition of parts and whole of the crop plants and farm animals studied.*

3. Main pests and diseases of crops.

*Recognition of main pests, their damage to crops, e.g. cotton stainer stem borers of cereals, weevils of grains and yam beetle. Recognition of main diseases of crops and their casual agents where feasible with characteristic symptoms, e.g. smut of cereals, maize rust, swollen shoot of cocoa, mosaic of cassava rosette and leaf-spot of groundnut, blast of rice and brown-rot of pineapple, nematodes of crops, parasitic seed bearing plants such as dodder and mistletoe, and nutrient deficiency symptoms.*

4. Seeds, fruits, food storage organs and other parts of the main plants and local weeds.

*Recognition of the structure of seeds and fruits of the main crop plants and of weeds in relation to the mode of their dispersal.*

5. Tools

*Recognition of common hand tools, e.g. cutlasses, hoes, forks, mattock, trowels, rakes, budding knives, shears, secateurs, chain measurer, sprayer etc. and their uses and maintenance.*

6. Animal feed-stuffs.

*Recognition and comments on the use of main animal feed-stuffs, e.g. palm kernel meal, blood meal, bone meal, maize, guinea corn, groundnut cake, fish meal and common forage crops, e.g. guinea grass, elephant grass, giant star grass, andropogon, calopogonium, pueraria, centrosoma and stylosanthis.*

7. Main pests and parasites of farm animals.

*Recognition of main ectoparasites and endoparasites of animals, e.g. ticks, lice, tape-worms and round-worms, recognition of ill-health symptoms.*

## AGRICULTURAL SCIENCE

### (ADVANCE LEVEL)

The syllabus that follows has been designed to portray Agricultural Science as an applied science with emphasis not only on the depth of but also in the acquisition of skills that are associated with the theory. It is therefore essential that candidates should make field trips to farms in different ecological areas and game reserves within the country, and

in different ecological areas and game reserves within the country, and should be exposed to the major products of the forest types in their country.

The syllabus has been designed to meet the needs of private candidates as well as those of school candidates. Candidates who wish to do a University course in Agricultural Science are advised to offer along with this subject at Advanced Level some other science subjects as may be necessary for entry requirements of the Universities.

It is desirable that candidates should have reached Ordinary Level standard in at least one of the following subjects:

Agricultural Science, Biology, Chemistry, Physics, General Science and Additional General Science.

The examination shall consist of three papers all of which should be taken.

### PAPER 1

2 - hour theory paper divided into three sections.

Section I: General Agriculture (5 questions).

Section II: Agricultural Economics (3 questions).

Candidates shall be required to answer four questions including at least two from Section I and at least one from Section II.

### PAPER 2

3 - hour theory paper divided into three sections.

Section I: Soil Science (4 questions).

Section II: Crop Science (4 questions).

Section III: Animal Science (4 questions).

Candidates shall be required to answer two questions from each section.

### PAPER 3 (Practicals)

A Farm Project to be assessed in the second term of the year of exami-

nation; and carrying 1/3 of the maximum marks for the practicals.

#### PLUS a 3-hour practical paper.

Note: (1) The content of the syllabus for the Practical's could be examined in the theory papers and vice-versa.

(2) Paper 2 alone may be offered as a Subsidiary Paper for H.S.C.

(3) Farm Project

The Farm Project would be assessed by an examiner of the Council. The Project Work would be inspected in the 1st term of the 2nd year or when the Project is at its peak. Schools will therefore be required to inform the Council of the Project Work being carried out by the students at the end of their first year.

### DETAILED SYLLABUS

#### A. General Agriculture

##### 1. Introduction

(a) Meaning and importance of Agriculture.

(b) Factors that determine the pattern of agriculture-ecological and sociological basis: ecological distribution of crops, animals and forests.

(c) Agricultural systems: principles and practice of cultivation nomadism, shifting cultivation, mixed cropping, crop rotation and mixed farming.

(d) The contributions of Agriculture to the national economy.

##### 2. Development of Agriculture

(a) Problems of subsistence agriculture-land tenure, education, health services, communications, soil erosion, transpor-

tation, attitudes, poor tools, government agricultural policies.

(b) General World Survey of the development of Agriculture with special reference to West Africa.

(c) Role of Science and Technology in the development of Agriculture.

(d) Administration of agricultural production and the role of government-agricultural policy, research, extension education and services,

education and services, financial assistance to farmers, veterinary services and quarantine services.

3. Land Tenure System and the Principles of Land use for Agriculture, Forestry and Wild Life Conservation.

Factors affecting land use-topography, economic and social factors, population, situation of land for commercialisation, farm settlement schemes; development, management and conservation of forests and soils.

##### 4. Fisheries

Distant sea, coastal and

Distant sea, coastal and inland water fishing, fish ponds curing, handling and distribution of fish. Marine products other than fish.

Note: Fish species to be mentioned Fishing equipment to be discussed.

##### 5. Agricultural Engineering and Surveying

(a) Problems and prospects of mechanization of agriculture in West Africa.

(b) Tools, implements and machineries-uses, care and maintenance.

- (c) Sources of power on the farm—wind, water, electricity, heat engines and animals.

Brief discussion on the working of the internal combustion engine.

- (d) Farm surveying farm buildings and constructions (simply treated).
- (e) Mechanization peasant agriculture.

## B. Soil Science

### 1. Genesis and Classification of Soil

- (a) Rocks and minerals—their characteristics and simple classification.
- (b) Weathering Processes
  - (i) Expansion and abrasion agents; water, wind and temperature.
  - (ii) Chemical Processes
 

Hydrolysis, hydration, oxidation, solution and reduction.
  - (iii) Biological Processes: Effects of organisms.

#### (c) Soil Formation

- (i) Factors of soil formation—climate and vegetation, relief and drainage, parent material, living organisms, time.
- (ii) Soil profile—soil horizon, soil profile defined: Genetic horizons of ideal profile specific to the area. Importance to Agriculture.

- (d) (i) Principles of soil classification.
- (ii) Kinds of soils in the local area and their existing classification.

### 2. Composition of the Soil

- (a) (i) Physical composition of the soil: soil components, soil structure, soil texture, soil air, soil water and soil temperature.
- (ii) Mineral composition of the soil: Quartz, feldspars, micas, clay minerals, montmorillonite etc.), colloids and colloid systems, colloids defined, properties state of colloidal system sol, gel.
- (iii) Organic components of soil—organic material, substance and matter; humus.

### B. Effect of Soil composition on properties of the soil.

### 3. Soil Fertility

#### (a) Plant Nutrient Elements

- (i) Classification
 

Macro-N,P,K,Ca, Mg,S  
Micro-B,Cu,Zn,Mo, Co,Fe,Mn.
- (ii) Factors leading to loss of these nutrients: Leaching, erosion, crop removal, etc.
- (iii) Replenishment of lost nutrients: Soil organisms: Micro-Macro-, effect of soil organisms on the soil. Nitrogen cycle; and carbon cycle; rock weathering, fertilizers.

- (iv) Soil management as an attempt to strike a balance between loss and gains in soil nutrients.

#### 4. Soil Conservation

- (a) Types of irrigation and drainage.
- (b) Soil erosion: Types, effects and control.
- (c) Methods of soil conservation: terracing, contour farming, strip cropping, cover crops, mulching, etc.
- (d) Water pollution and recovery (where it applied).

### C. CROP SCIENCE

Candidates should be familiar with agricultural and botanical methods of classification of crops

methods of classification of crops as well as the identification, morphology and reproduction of important crop plants.

#### 1. INTRODUCTION

Origin and geographical distribution of some important tropical crops including forage crops. Nomenclature and classification of crop

ture and classification of crop plants. Examples should be drawn from the major classes of locally cultivated crops.

#### 2. FACTORS AFFECTING CROP PRODUCTION

Ecological physiology of crop plants: the primary effects of light, radiation, temperature, water and inorganic elements on crop growth, development and yield.

#### 3. PRINCIPLES OF CROP PRODUCTION

Land preparation.

Methods of propagation: seed selection and testing, vegetative propagation. Nursery practises: time of planting and planting distances.

#### 4. PRINCIPLES OF PLANT BREEDING AND CROP IMPROVEMENT

- (a) Aims of crop improvement;
- (b) Basic genetic principles of crop improvement;
- (c) Methods of crop improvement:
  - Introduction and mass selection;
  - hybridisation;
  - multiplication;
  - vegetative propagation.

#### 5. PRINCIPLES OF PLANT PROTECTION

- (a) Diseases of crop plants: Causal agents, symptoms, methods of transmission and eradication of diseases associated with the crops studied.

#### (b) CROP PESTS

- (i) Classification of field and storage pests; extent of damages:
  - e.g. insect pests,
  - nematodes, rodents,
  - birds and human beings.

- (ii) Principles of pest control: mechanical, biological, cultural and chemical.

#### (c) WEEDS AND THEIR CONTROL

- (i) Identification of common weeds and modes of dispersal; study of selected weeds with particular reference to locality.

- (ii) Control: mechanical biological, cultural and chemical methods.

#### 6. STUDY OF SELECTED CROPS

Origin, geographical distribution; climatic and soil requirements: cultural practices, harvesting, processing marketing and storage of West African arable crops, cash crops and vegetative crops.

- (d) (i) Principles of soil classification.
- (ii) Kinds of soils in the local area and their existing classification.

## 2. Composition of the Soil

- (a) (i) Physical composition of the soil: soil components, soil structure, soil texture, soil air, soil water and soil temperature.
- (ii) Mineral composition of the soil: Quartz, feldspars, micas, clay minerals, montmorillonite etc.), colloids and colloid systems, colloids defined, properties state of colloidal system soil, gel.
- (iii) Organic components of soil-organic material, substance and matter; humus.

## 1. Effect of Soil composition on properties of the soil.

### 3. Soil Fertility

- (a) Plant Nutrient Elements
  - (i) Classification Macro-N, P, K, Ca, Mg, S  
Micro-B, Cu, Zn, Mo, Co, Fe, Mn.
  - (ii) Factors leading to loss of these nutrients: Leaching, erosion, crop removal, etc.
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- (ii) Principles of pest control: mechanical, biological, cultural and chemical.

### (c) WEEDS AND THEIR CONTROL

- (i) Identification of common weeds and modes of dispersal, study of selected weeds with particular reference to locality.

- (ii) Control: mechanical, biological, cultural and chemical methods.

## 6. STUDY OF SELECTED CROPS

Origin, geographical distribution; climatic and soil requirements: cultural practices, harvesting, processing marketing and storage of West African arable crops, cash crops and vegetative crops.

The study should include at least one cereal from group 1, one legume from group 2, and four plants chosen from at least three of groups 3,4,5 and 6 below:-

#### GROUP 1

#### CEREALS

Maize-Zea mays.

Millets-Pennisetum typhoides, Setaria italica, Eleusine corocana

Rice-Cryza sativa

Guinea Corn-Sorghum bicolor (S. vulgare)

Wheat-Triticum vulgare

Tamba

Acha

#### GROUP II

Beans-Phaseolus spp

Cow peas-Vigna unguiculata

Groundnut-Arachis hypogea

Soya Beans-Gycine soja

Bambara groundnut-Voandzeia geocarpa (V.Subterranea)

Yam bean-Sphenostylis steno-carpa

Pigeon pea-Cajanus cajan

#### GROUP III

Cassava-Manihot esculenta

Yams-Dioscorea Spp

Cocoyams-Araceae (Colocasia or Xanthosoma)

Potatoes (European P)-Solanum tuberosum (Hausa P.)-Plectranthus esculentus

Sweet Potatoes-Ipomoea batatas

Onions-Allium cepa

Shallot-Allium ascalonicum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicum esculentum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicum esculentum

Carrots-Daucus carota

Cabbage-Brassica oleracea

Cauliflower-Brassica oleracea, var. botrytis.

Graden egg-Solanum melogena

#### GROUP IV

Avocado pear-Persa gratissima

Bananas-Musa Spp

Citrus-Citrus Spp.

Guava-Psidium guajava

Mango-Mangifera indica

Pawpaw-Carica Papaya

Pine-apple-Ananas sativus

Cashew-Anacardium occidentale

Water melon-Colocynthis citullus

#### GROUP V

Cocoa-Theobroma cacao

Coffee-Coffea Spp.

Colanut-Cola Spp.

Benniseed-Same as Sesame

Ginger-Zingiber officinale

Sugar cane-Saccharum officinarum

Peppers-Piper nigrum\*

#### GROUP VI

Coconut-Cocos nucifera

Oil Palm -Elaeis guineense

Cotton-Gossypium Spp

Shea-butter-Butyrospermum park ii

Sunflower-Helianthus annuus

Sesame-Sesamum orientale

Rubber-Hevea brasibensis

Sisal hemp.-Agave Spp.

Kapok-Ceiba pentandra

Kenaf.

Urena lobata.

#### 7. PASTURES AND FORAGE

Pasture agronomy, grasses, legumes, their distribution, improvement, quality and assessment, establishment and conservation.

#### D. ANIMAL SCIENCE

##### 1. Introduction

Role of livestock and livestock products in West African countries.

##### 2 FARM ANIMALS

Types and classification of locally available breeds of cattle, sheep, goats, swine, poultry.

#### 3. ANATOMY AND PHYSIOLOGY

- (a) Brief gross anatomy of named domestic animals: cattle, goats, horses, pigs, sheep, rabbits, poultry and fish.
- (b) Physiology of digestion, reproduction, lactation, milk let down, egg formation and laying, circulatory, and endocrine systems.

- (c) Environmental physiology: The direct and indirect effects of climate (tropical) on farm animals with due regard to their effects on grazing habits, growth, reproduction, milk production, egg production, gross yield and quality of food supply.

#### 4. ANIMAL NUTRITION

- (a) The main nutrients-carbohydrates, proteins, fats, minerals, vitamins, water-their chemical composition and their role in animal nutrition. Malnutrition in farm animals.
- (b) Feeds and feeding-methods of preparation of foodstuffs for farm animals-cooking, cutting, grinding, pelleting etc.

*Note: Emphasis should be laid upon the reason for feeding these forms of feeds to the different types of animals.*

- (c) Principles of ration formulation-balanced maintenance, production, starter rations.

*Note: Mathematical and technical details of ration formulation will not be required.*

#### 5. ANIMAL HEALTH

##### (a) DISEASE

Causes and prevention; pest and parasite control; insects and ticks as carriers of diseases in farm animals. Life history of one endoparasite of farm animal (e.g. liverfluke, roundworm, tape worm, trypanosomes); and one ectoparasite (e.g. ticks and lice).

- (b) Diseases as the limiting factor in the development of animal

husbandry in West Africa. Detailed study of the more common diseases of local farm animals, preventive and control measures, in respect at least one of each type of

- (i) Virus-fowl pox, foot and mouth diseases, rinderpest.
- (ii) Bacteria-Anthrax, tuberculosis, contagious abortion.
- (iii) Fungi-Scabbies, ringworm.
- (iv) Protozoa-trypanosomiasis, coccidiosis.
- (v) Metabolic-milk fever, ketosis, rickets, bloat etc.
- (vi) Mycoplasmatles-pleuro-pneumonia.

## 6. MANAGEMENT OF FARM ANIMALS

Detailed study of management aspects of the following farm animals from birth to maturity: Monogastric e.g. pigs, poultry Ruminant e.g. sheep, goat, cattle. Herbivore e.g. rabbits, guinea-pigs.

A field study of at least one animal from each class is essential.

## 7. BREEDING AND IMPROVEMENT OF FARM ANIMALS

- (a) Aims.
- (b) Principles of genetics in respect of animal breeding.
- (c) Methods: Selection, inbreeding, crossbreeding and effects. Artificial insemination. Castration.

## E. AGRICULTURAL ECONOMICS

1. Factors of production-land, labour, capital, entrepreneurship.
  2. Law of diminishing returns.
  3. Principles of demand and supply.
  4. Marketing of agricultural products.
- (i) Operations-Processing and storage, packaging, transportation and distribution.
  - (ii) The role of the producer, middleman and the consumer; individuals, co-operatives, corporations, firms, Marketing Boards.
  - (iii) International Trade with respect to agricultural produce.

5. Agricultural Financing-sources and nature of farm credit and financing.

6. Farm Record  
Farm diary, input records, production records, farm inventory, farm log-book.

## 7. Simple Accounting

Preparation of entries of sale and purchases, profit and loss accounts.

## PRACTICAL EXAMINATION

During the course the candidate is expected to have carried out and participated in practical work on livestock management, farm and vegetable gardening practices. Candidates should also be exposed to the major products of the forest type in their locality.

It is essential that candidates go on field trips to farms in different ecological areas and game reserves within the country.

The Practical Examination will test comprehension, skill observation and recognition.

## SYLLABUS

### A. GENERAL AGRICULTURE

Identification, uses, and maintenance of common farm tools, implements and simple farm machines.

### B. SOIL SCIENCE

1. Identification of common rock types (igneous, metamorphic and sedimentary).
2. Soil profile from practical field work.
3. Laboratory work on physical properties of soil:
  - (a) Mechanical analysis using the hydrometer method and sieves.
  - (b) Determination of particle density and total pore space.
  - (c) Determination of moisture content of a moist soil sample.
  - (d) Determination of maximum water holding capacity.
  - (e) Determination of wilting point to be demonstrated.

### 4. Laboratory work on chemical properties of soil:

- (a) Demonstration of use
  - (a) Demonstration of use of pH meter.
  - (b) Demonstration of active and reserve acidity using the pH meter, and colorimetrically using a comparator.
  - (c) Evidence of cation exchange by displacement of cations with potassium and precipitation of the displaced calcium with ammonium oxalate.

## C. CROP SCIENCE

1. Identification of seeds, seedlings, fruits, storage organs and other essential parts of the more common crop plants, local weeds, pasture grasses and legumes.
2. Identification of casual organisms (where possible), nature of damage, prevention and control methods for the common crop pests and diseases.
3. A working knowledge of planting dates, seed rates and plant population, germination testing of the more common local crop and plant population, germination testing of the more common local crop plants is essential.

4. Candidates may be tested in the following skills:

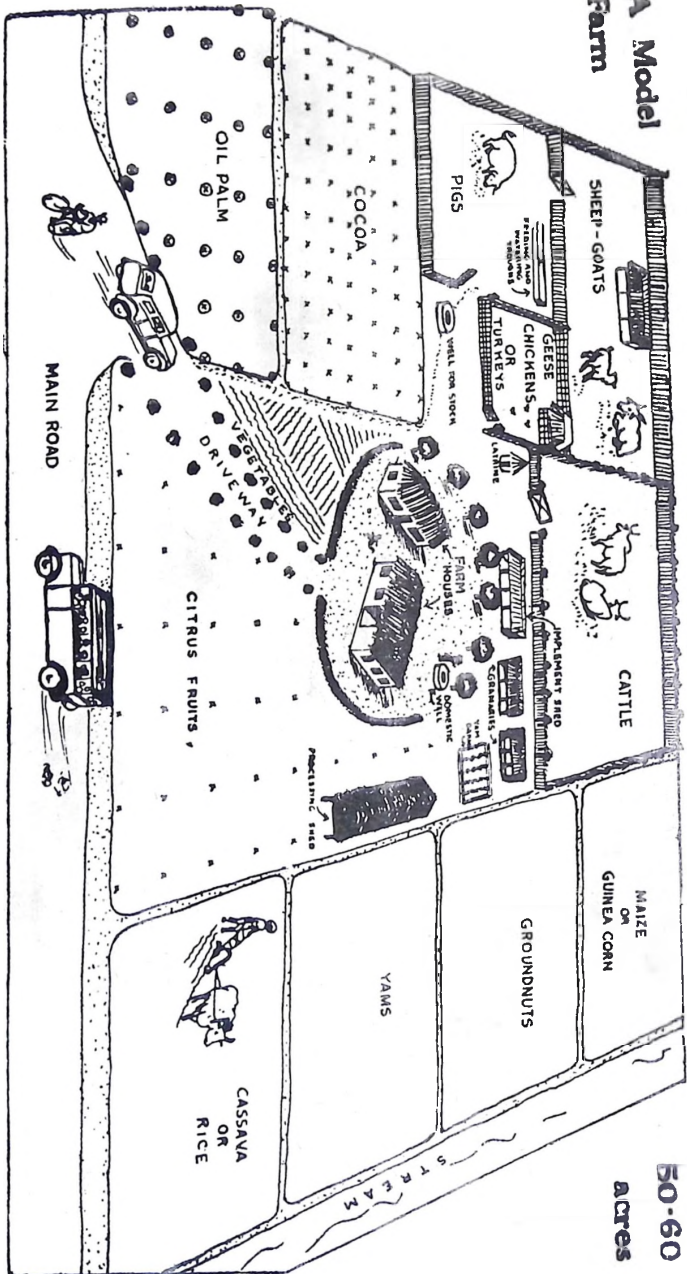
Preparation of seed beds, fertilizer applications, mulching, watering, use of spraying equipment, vegetative propagation, germination testing.

## D. ANIMAL SCIENCE

1. Identification of the more useful breeds of animal types available in the student's locality. Methods of restraint, handling, and grooving farm animals.
2. Identification of the major internal organs of farm animal (no microscopic studies), e.g. organs of the digestive systems, liver and kidney.
3. Identification of the common ectoparasites (e.g. ticks and lice),



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WEST AFRICAN FARMERS' & COOPERATIVES' MONTHLY

AUGUST '75

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# FARMSTOCK

WEST AFRICAN FARMERS' AND CO-OPERATIVES' MONTHLY

Managing Editor ABIQDUN OJUGBELE

AUGUST '75

30k

Cover Pix

## NIGERIANS STUDY RURAL DEVELOPMENT AT ENGLISH UNIVERSITY

*Dr Emmanuel N. Agwu-nj second from left) a Principal Livestock Development Officer from Nigeria's Federal Minister of Agriculture and National Research, and Mr. Ikechukwu Ikpelue (third from left) an agricultural officer from the Mid-west State Government, are seen here with a group of overseas government officials being shown round the Home Farm of Harewood House - the famous Stately Home of Queen Elizabeth's cousin, the Earl of Harewood.*

*They are among specialists from seventeen countries currently attending a three months course in planning and economic appraisal of rural projects at the University of Bradford, in northern England.*

*The course is designed to give a sound working knowledge of the methods and approaches to the planning and development of agriculture, forestry and rural projects.*

*Although the course concentrates on the wider issues and problems of rural planning and development the students will also consider related topics including economics, work skills and management.*

*Courtesy of B. I. S London.*

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**LETTERS**

# WE WANT A GREEN REVOLUTION

Nigeria's Agricultural Development has been lying dormant for years without any apparent radical changes necessary to cope with feeding her population properly.

Our former leaders were blind to the reality of formulating a progressive nation wide agricultural plan. Most of our farmers are no better than the days of their predecessors. Hoes and cutlass remain the most popular farming implement in most parts of the country

There is no marked improvement in our cultivating system while the farmers are as ill-educated and ill informed as ever. Government assistance where necessary had been woefully neglected. Stretches of land lay waste for lack of planning while food production continues to decline in output

It is with this gloomy picture of our agricultural system that I call on the Federal Government to effect a radical programme for farmers. A more revolutionary approach should be embarked upon with all the resources at our disposal. Already we have fallen into No. 4 position in cocoa production while our leading position in palm kernel is shockingly threatened.

There is also a general decline in food commodities like gari, palm oil, groundnuts oil beans etc. Nigeria with her vast resources both natural and human should be able to blaze the trail of agricultural revolution in Africa.

Lagos. Yemi Onabolu

## HIGHLAND TOMATOES

An agricultural expert once said that Jos in the Benue-Plateau State can be one of the world largest producer of tomatoes. This assumption was based on the favourable weather condition of the area.

In view of this it will be of great benefit to us if we can utilise this favourable weather condition and expedite tomato growing in the area. This will also save us a lot of money spent on the importation of tinned tomatoes. At least what stops us from having our own highland tomatoes when God has bestowed on us the fertile land.

Jos. Umaru Abubakar

**M**oney doesn't make a fool out of a man nearly as often as a girl makes money out of a fool.

× × ×

**W**hen a woman asks to see something more expensive she's shopping; when she asks to see something cheaper, she's buying

## SET UP VILLAGE CO-OPERATIVE BANK

Will you kindly permit me a few lines in your magazine to express my opinion on ways and means of improving village farming? I suggest that village Co-operative

Bank should be set up in remote parts of the Country to help poor farmers

The Bank will lend money to purchase seedlings fertilizer and necessary equipment. These will produce a better harvest to help the farmers pay back the debt

Otta Oluayemi Aganran

## ENCOURAGE DIARY

Among the most neglected aspect of our agriculture in Nigeria is diary. This stems from the fact that only government and very few Companies can undertake the venture which requires large financial outlay.

Already there are some government diary farms, but their productivity is far below the requirement of the nation.

We should strive to establish diary farms that would be able to supply us with abundant milk, butter, cheese, bacon etc.

I hope the government would include these essential products in her five years development plan.

Lagos. Micheal Orizu Rauchi. Usman Babi

## LET'S HAVE MECHANISED GARI PLANTS

The prices of gari have gone up now so much that even the poor has been forced to pay more since it is the only food item within his reach. This increased cost is a result of lower production. Farmers are now producing below what is required for consumption. As the record shows, the output to be on downward trend, we may soon reach a stage when gari has to be imported to supplement home demand.

I therefore appeal to the Federal and State Governments to set up mechanised gari plants as this will enable farmers to concentrate on growing cassava to feed the plants with raw material.

Ibadan Tunji Omoba

## SCHOOL FARMS

I give accolade to your editorial SCHOOL FARMS in the June edition of FARM STOCK. As we are now witnessing that the drift from rural to urban areas is increasing at a tremendous rate, the enthusiasm of becoming a farmer is fast declining in our youths. This as a matter of fact is the result of lack of encouragement and bleak future that await would be farmers.

In as much as the main cause of this drift lies in the search for security and steady living, the exodus will continue unless such security and steady life is available in the farms.

Farming too can be made attractive if there are schools for FARMING where the intending farmers can undergo the basic technique of farming. However, the products of the school farm should be aided by the government through loans to purchase necessary implements. Fertilizer and seedlings too should be provided at subsidised rates.

All in all the success of the scheme will depend of the incentive offered by the government.

## **INCREASE IN COCCA PRICE**

The producer price of Cocoa has been raised from fifteen to sixteen cedis with immediate effect. Announcing this at a rally at Koforidua in the Eastern region to mark the International Cocoa Day, the Head of State and Chairman of NRC., Col. I.K. Acheampong said the increase is a recognition of the efforts of farmers.

The Ghana Government in a short period of three years has raised cocoa price four times from eight to sixteen cedis. The increase, according to the Chairman, is to encourage farmers not only to improve production, but also to improve their living standards.

## **GHANA SOON TO EXPORT RICE**

Ghana might export rice to neighbouring countries by the end of the next agricultural season. Commander J.K. Amedume, Ashanti Regional Commissioner told the Right Reverend David Brown, Anglican Bishop of Guildford and his wife in Kumasi. Bishop Brown who was on a two-day visit to Kumasi as part of his visit to Anglican Diocese in West Africa paid a courtesy call on him at the residency. Commander Amedume said three years ago Ghana imported about 95 per cent of her rice consumption "but since the launching of the "Operation Feed Yourself" programme, every rice consumed in the country is produced locally while several scholars had taken to serious farming. Bishop Brown had earlier praised the government's agricultural policy and suggested that in order to attract more school leavers to the agricultural field, sixth formers must be introduced to all branches of agriculture so that by the end of their course, they could choose the field of study in which they were interested.

# **TRADE FAIR**

**THE THIRD GHANA INTERNATIONAL TRADE FAIR WILL BE HELD IN ACCRA FROM FEBRUARY 1 - 15, 1976.**

## **PLAN TO EXHIBIT NOW**

**For detailed information please contact:-**

**The Public Relations Officer,  
Ghana International Trade Fair,  
Trade Fair Post Office,  
ACCRA.**

**Tel. 75311**

**Telex 2105**

**or**

**GHANA HIGH COMMISSION,  
LAGOS TEL. 25761**

**and**

**ALL GHANA MISSIONS  
ABROAD.**

*(Issued by the Information Section of the GHANA HIGH COMMISSION, Lagos)*

## **cooperatives and grains**

This season is one of plenty. Harvesting will go on for some time until around November, scarcity of one item or another will be creeping in.

The average farmer is now selling his products at give away prices. He cannot do otherwise because he needs money. What then can save us from the bogey of plenty today none tomorrow?

Storage entails huge costs usually beyond solo effort, therefore team work is the answer. No other team readily comes to mind beside the co-operative bodies in whose bank tills fortunes are stored away in cash only to be lent on interest in drips to borrowers who will need money mostly for consumption.

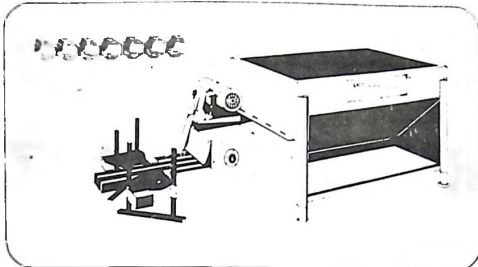
Although relief is relief, one form is however better than another. The co-operatives can relieve the farmers of much headache by buying up their grain stores at reasonable prices now to be sold to the public steadily afterwards.

The two effects to be created are steady prices and the avoidance of waste usually experienced at harvest time. Another important result to follow if the co-operatives come in timely will be the removal of the unhelpful role of middlemen. They usually make things difficult for both the farmer and the buyer.

The poultry business readily comes to mind. Unless there is plentiful grain, the business suffers, eggs and chickens will be scarce and the benefit derivable from these items of food will be out of the reach of many.

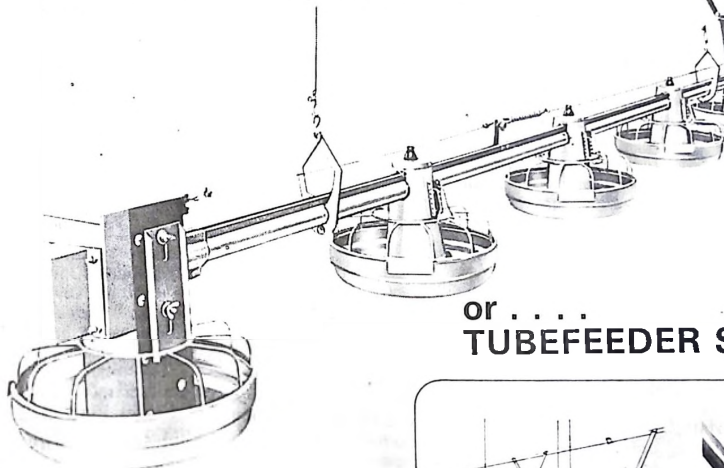
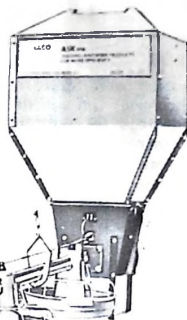
The co-operatives must come in quickly now.

**LACO** more than 20 years of experience  
in the design and manufacture of poultry-equipment.



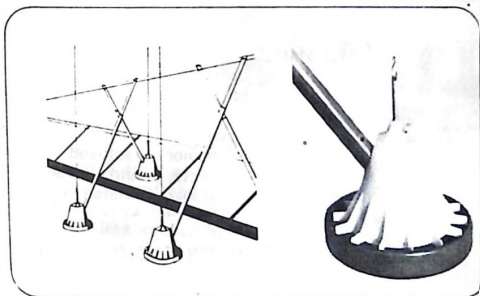
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 oil or petrol  
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# NIGERIA REPRESENTED AT SEMINAR ON MAIZE

Ways of improving the yields of maize were discussed at London University's Wye College in Ashford, Kent, recently when experts from all over the world - including Nigeria - attended a one day seminar on the subject organised by the College's Maize Unit.

Representing Nigeria were Professor D. McDonald from the University of Ibadan and Mr. Iremiren, a post graduate who is studying at Wye.

Dr. Alastair Allen, from the Kitale research station, presented a paper on climatic factors in the development and yield of maize crops in Kenya and the expansion in production that is taking place there. Dr. Allen is currently back in Britain to write a report on production for the Kenya Government.

Other topics that were discussed were physiological factors of production and requirements for future research work into ways of

improving crops.

A member of the Wye College's Maize Unit said that in recent years Britain had begun cultivating maize for animal consumption and industrial use.

"Much of the work we are carrying out at Wye is relevant to developing countries. At the moment we are concerned with experiments with French and Northern European seed, but the technology we are using in improving yields is applicable to all maize growing areas".

World production of grain maize is of the order of 300 million tons a year and is second only to wheat. The grain is used extensively for human and animal feed and provides a major source of starch for industrial use.

Britain imports 3 million tons annually. Some 20 acres of maize silage is being grown at Wye College together with an extensive area of trials plots and an acre for grain maize. Over year - 75% more than 1974.

Wye College's Maize Research Unit, which is supported by the Home-Grown Cereals Authority, is engaged on studies into the agronomy, mechanisation and economics of production.

## BOOST TO FARMING IN BP

The Bokkos Farm Project in the Benue Plateau State has been inaugurated by the Kano State Military Governor.

Stressing the aim of the project the State Governor hopes to increase food production in the state.

The project will also provide venue for the training of local personnel management and reduce unemployment.

The Governor disclosed that similar projects would be established in Gboko Division of the State.

## FERTILIZER FACTORY NEAR COMPLETION

The Federal Government owned super-phosphate fertilizer plant at Kaduna is due to commence operation soon.

When production starts, the complex will produce super-phosphate fertilizer daily.

A blending plant would also be established to produce concentrated N-P-K fertilizer.

The factory will provide employment opportunity for about 300 Nigerians.

## ADA TO SPEND N72m FOR DEVELOPMENT

The East Central State Agriculture Development Authority, plans to spend N72.18 million during the Current National Development Plan.

While addressing a news conference at the Enugu Press Club, the ADA President Mr. Achukwa disclosed that N6m had been invested in the authority applied investigations during three years of its experimental phase.

The President also revealed his authority's investment of N1.8 million in its Oghe cashew and poultry complex project in Udi Division.

There are also moves to aid private farmers, to this end the authority was going into partnership with a private piggery farmer - The RECONO Properties Company Limited.

## LAND ACQUIRED FOR AGRIC SCHOOL

The South Eastern State Government has acquired a large parcel of land for the permanent site of the School of agriculture at Adu.

Construction of blocks to enable the School to move to its permanent site during 1976/77 academic session will begin soon.

This was made known by a reliable source of the Ministry of Natural Resources during the graduation ceremony of the second batch of students which took place at Obubra.

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Continue on p. 11

# COOPERATIVES

## OGBAKU COOPERATIVE MOVES ON

The year 1967 marked a turning point in the history of co-operative Society at Ogbaru Division. Preceding this period, there was no organised co-operative Society in the area. The formation of Abo-Atani farmers' multipurpose co-operative society radically altered the farming picture of the area.

Situated along Atani-Ozubulu road, it has most of its members from experienced rice farmers who had lived and cultivated rice for some years in Ibadja in Northern Nigeria prior to the Nigeria crisis.

### CRISIS

As a result of the crisis they were forced back home during which they underwent series of upheavals. However, during the civil-war they cultivated paddy rice supplied to them by the then Ministry of Agriculture and Natural Resources.

They were able to mill the rice at a private mill in Ihiala when the war came to an end.

Subsequently, their effort to procure a mill of their own through the Rehabilitation Commission failed. This drove them into partnership with a private businessmen in Onitsha who had a million machine.

The association was shortlived and the society had to rely on its own initiative which has enable it to grow and expand.

The Society which was registered 1971 with current member tered in 1971 with current membership strength of 71 people comprising seasoned farmers owed its success to the President Mr. Udogwu Okenwa of Okija, treasurer Fred Ewizie and Geogrey Ifeacho secretary.

The Abo-Atani farmers' multipurpose society's is managed on the shareholding basis.

Each share capital is worth N200.00 and members are to hold at least five shares and pay entrance fee of 20k.

The objectives of the society is to improve the standard of its people, attunement to modern methods of farming and extension of fishing activities.

Society members also benefit from loans made available to them to obtain seedlings and agricultural equipment which enables them to undertake profitable cultivation of yams, cassava, maize and rice.

During the harvest period, traders from many parts of the state and some parts of Northern State and Rivers State are attracted to the area.

The spirit of this self-help scheme of Ogbaru natives had attracted a loan of about N1,500.00 from the East Central State Reha-

*Continue on p. 10*

### CO-OP UNIONS IMPORED TO STRIVE HARD

On the occasion of the 53rd International Co-operative Day in Ibadan recently, the President of the Co-operative Federation of Nigeria, Pastor E.T. Latunde implored the co-operative and union staff to strive harder.

In his address to the union, Pastor Latunde entreated the union to assist affiliated unions to enable them know the benefits of becoming co-operators.

He also urged the Federal Government to give more and financial assistance to Nigerian farmers.

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bilitation Commission in 1973. The loan helped to increase the production of yams, rice, cassava and maize.

To this end it has acquired 521 acres of land for planting rice; 450 for cassava; 400 for maize; and 10 acres for yams.

The success of Abo-Atani co-operative society spurred the formation of Udoka multi-purpose co-operative society which was formed in 1971 with a membership of 18 persons who were mainly farmers and fishermen.

The society was run in line with those of the former society with similar objective to improve living standard and better farming conditions.

**FURTHER GROWTH**

The Orabuike credit and thrift co-operative society formed in January has also joined the group of co-operative societies in Obaru Division.

The society with a membership roll of 37 people appears to be the first of its kind in the Division. Comprising cross section of all trades, profession and businesses.

With the formation of this Co-operative Society the people of Ogbaru Division will become more self-reliant. Furthermore, it would be building a legacy for the future generation who would have better opportunity to infuse modern agricultural method into an already established system.

In the meantime the people should concentrate their energy on consolidating the already laid foundation. This will necessitate closing ranks and absorbing the mushroom co-operatives to form one large viable co-operative capable of providing the needs of the people.

**Rasaq Alli - Balogun.**



All hands on the deck, the above picture seems to indicate, leaving no one behind in feeding the ever growing population of our Country. The leader of Otu Olu Obodo women organisation Oru Division Mrs. Rose Koles is seen with a stick at Otu Olu Obodo fam.

**COOPERATIVE EDUCATION TO BE ESTABLISHED**

The Federal Government is proposing the establishment of a Co-operative Education and Enterprises Development Centre for Research and Training throughout the Federation.

This fact was made known by the Federal Registrar of Co-operative Societies, Mr. J.O. Taiwo while addressing the opening session of a three-months course of co-operative and business management.

The decision to establish the Centre hinged on the role which co-operatives are expected to play during the third National Development Period.

In his address the Director of the Nigerian Institute for Oil Palm Research (NIFOR) Mr. E. Ogor, said that because of the massive programme of the Institute United Nation Development Programme had been called upon to assist NIFOR with men and equipment.

NIFOR he said had already circulated research results to farmers through workshops seminars and publications.

There are also moves to aid private farmers, to this end the authority was going into partnership with a private piggery farmer - The RECONO Properties Company Limited.

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# FOOD PRODUCTION : WOMEN IN THE FRONTLINE

In the East Central State, women have formed various economic groups for co-operative farming with a view to increasing food production. Among such groups is the Ozuh - Omuma Wing of the Otu Olu Obodo Women Organisation in Oru Division.

The group has planted cassava in an eighty hectare piece of land recently acquired. The Organisation's leader Mrs. Rose Koles wants young girls to be included in their programme purposely to check their drift to the cities and

much more important to make them helpful to their mothers at home.

Otu Olu Obodo Women Organisation is also in Udi, Okigwe, Mbaise and several other places.

## NEWS

### KWARA LAND SCHEME LAUDED

The Kwara State "Farmers' Land Settlement Scheme" has been praised by the Kwara Group Farmers, a farmers association in Ilorin.

The Scheme said the chairman of the group Mr. Bayo Ajayi who has just returned from the Royal Agricultural Show compared favourably with those he saw in England.

Under the scheme, the State Ministry of Agriculture plough, ridge, plant and fertilize farmlands before handing them over to owners.

### RURAL FARMERS WILL BE PROTECTED

In pursuance of its mechanised farming programme, the Midwest Government would not displace rural population in the state.

It is the desire of the Government to increase the agricultural productivity of the state and by the mechanisation of farms more food would be available.

Farmers will be re-allocated at suitable sites if their farms

are taken over by the government.

The government also has urged local farmers to form themselves into co-operative and medium scale farmers, so that they would be given loan.

An agreement has been signed between the Midwest Government and the Nigerian Agricultural Bank, Kaduna, which would make available N3.5 million while Midwest would provide N3.5 million in making a total of N7.00 million loan available to farmers.

### WATER POWER COMPANY LAUNCHED

The North Central State Water Board in conjunction with Messrs. Wakuti Gmbh of Switzerland has inaugurated a Water and Power Development Company (WAPDECO). In the joint venture Messrs. Wakuti hold 49 percent share while the North Central State Board hold the majority share of 51 percent.

Outlining the objective of the new Company, the State Commi-

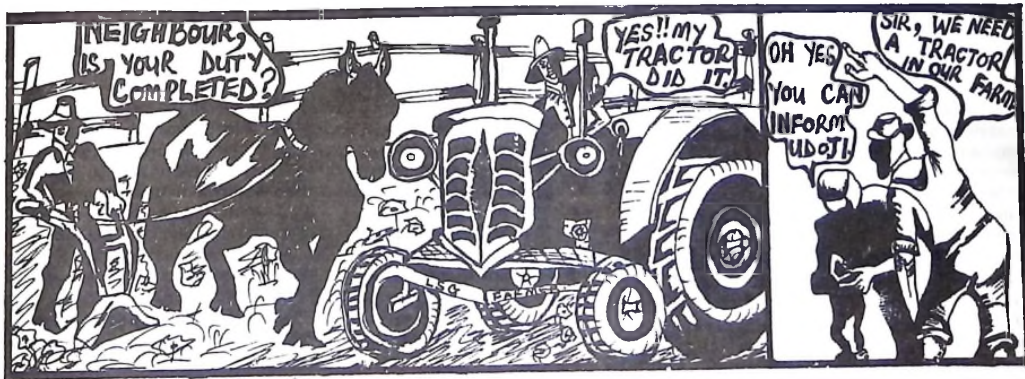
ssioner for Finance who is also the Chairman of the State Water Board, expressed the government intention of utilising the expertise of the Swiss technical knowhow to form a virile indigenous Company.

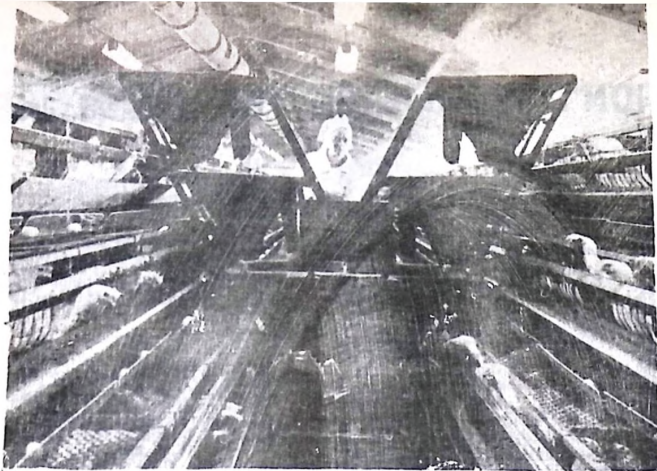
Messrs. Wakuti plans to develop the water sources of the state. The implementation of this project would counter any hardship that may result in case of future drought.

### FACULTY OF AGRICULTURE EXPANDS

The Department of Animal Science of the Faculty of Agriculture in the University of Nigeria Nsukka, East Central State have placed order for equipment worth N300,000.00 to enlarge its Cattle Centre. The equipment which are expected towards the close of the year will help in increasing the production of milk to serve the University and environs besides buildings to house goats, pigs and poultry are also under way.

As the Country is constantly facing meat shortage, this step is one in the right direction.





There is a steady increase in the production and procurement of poultry, due to the high level of automation and mechanization in this sphere of Soviet Agriculture.

Photo shows feed distribution in a poultry farm department.

## USSR

### INDUSTRIALISATION OF LIVESTOCK BREEDING IN THE USSR

By Gleb Spiridonov, APN Political Correspondent

As one of the most important tasks in working out a general line for boosting agriculture ten years ago a plenum of the CPSU Central Committee mapped a programme for the further development of livestock breeding. At that time, livestock breeding was one of the most backward sectors. Fixed procurement plans for livestock products and higher purchase prices, by 20 to 70 per cent, were established, while retail prices remained the same. The government rendered material aid to the state and collective farms by pouring additional money into livestock raising.

In keeping with the directives of the 24th CPSU Congress, widescale measures to transfer livestock breeding on an industrial basis are being carried out in the current ninth five-year plan period. The construction of large cattle-breeding complexes and poultry factories that would produce pork, beef and milk, eggs and fowl have started on the outskirts of large cities. The successful implementation of the party's agricultural policy has promoted a radical turn in the development of collective and state cattle-

breeding. As a result, in the last decade the output of meat in the USSR has increased 1.7 times, milk 1.5 times, eggs more than twice. This has improved the supply of city population with the most valuable food products.

However, the present state of livestock breeding is still incapable of fully satisfying the increased

### *farming in other lands*

demands on its produce. In order to add to the quantity of foodstuffs, consumed by its citizens, the USSR buys a certain amount of meat, meat products and eggs from the fraternal socialist countries - Bulgaria, Hungary, Mongolia and Poland. These purchases make up less than 1 per cent of the total output of livestock products in the country. The meat that is purchased from time to time in the West does not make much difference in supplying the population of the country.

One of the most important ways of dealing with the problem, and that is exactly what Soviet agriculture is doing now, is the specialisation and further concentration of livestock breeding and its transformation along modern industrial lines. The Ministry of Engineering for Livestock and Fodder Production of the USSR has been set up in order to better cope with the all round mechanization of livestock breeding.

Today, scores of machine building

plants are working for this field of agriculture. The large cattle-breeding farms and complexes organised in recent years in a number of regions show the high efficiency of specialisation and complex mechanisation. They have attained a significant increase in the output of marketable surplus, a reduction of labour expenditure, economy of fodder and the decrease of prime cost.

The higher material and technical potential has made it possible to effectively combine the economic and production resources of the individual farms. Inter-collective farm and state and collective farm enterprises and associations are being set up in all the republics and regions of the country. There are more than 5,600 of them to date and the majority are cattle-breeding complexes, large farms, factories producing mixed fodder, and poultry factories.

The intensification of cattle breeding in the USSR is conducted on a planned basis in the interests of the farmers and the working people. It is aimed at improving working conditions, raising the material welfare and the cultural and technical level of the farm workers and at the same time it is called upon to provide the production of low-cost high quality livestock products in quantities that would fully satisfy the demand of the 250 million population of the Soviet Union.

## UK

### AN ANSWER TO WORLD FOOD PROBLEMS

Technology developed by British Petroleum (BP) for producing protein on a commercial scale from oil is beginning to make a significant contribution to world food problems.

The latest advance in the international adoption of BP protein technology is the plan to establish an integrated plant in Saudi Arabia to produce 100,000 tons a year of protein as a joint venture with Saudi's state petroleum and mineral organisation.

If, as expected, the BP Saudi study group complete their work in six months the plant could be in production by 1978 making Saudi Arabia the second major oil state to opt for

*continue on p. 16*

## AGRIC NOTES

### Raspberry Trial Pays Off

Raspberries have been grown successfully for the past 12 years at the Horticultural Centre, Loughgall, Northern Ireland, even though the land has never been cultivated since the canes were planted.

Instead, weeds have been controlled by the use of herbicides.

Herbicide sprays facilitated plantation management - particularly during wet soil conditions - without any reduction in crop yield.

Indeed, during the eleventh and twelfth years of the experiment, the herbicide-treated raspberries yielded significantly out-yielded those in which cultivations were used to keep down weeds.

Some canes were given a mulch of farmyard manure and, although this did not increase crop yield, it did prevent soil erosion and water run-off on sloping sites.

### Whole Wheat For Birds

Pullets can be reared cheaply and successfully from 12 weeks of age on a diet consisting solely of whole wheat, although preferably with a vitamin-trace element supplement, according to an experiment at the Agricultural Research Institute of Northern Ireland at Hillsborough Co., Down.

Fed from 12 weeks of age onwards, the whole wheat diet cut feed costs, not only because it was cheaper than a conventional rearing ration of 14.8 per cent crude protein, but also because feed consumption was slightly reduced.

And, apart from about four days' retardation in sexual maturity, the treatment had little effect upon adult performance.

However, when replacement pullets were put on to the whole wheat diet at only nine weeks of age, there was a high mortality rate because of cannibalism which was only partly reduced by the addition of the supplement.

### Poultry Waste - Another Green Light

A wide range of live-stock rations could usefully incorporate dried poultry manure according to trials which have been carried out at the Poultry Research Centre, Edinburgh.

These indicate that five per cent can be fed in replacement pullet rations - and up to 20 per cent in

broiler starter feeds, ten per cent in broiler finisher, and 14 per cent in replacement pullet rations - and up to 20 per cent in layers' rations, according to the report.

Chief nutritionist at the centre, Dr. William Bolton, told a conference in Norfolk that dairy rations could take 10 per cent of dried poultry manure and beef rations as much as 20 per cent.

However, Fr. Bolton added, while he had no reservations about the safety of dried battery manure from layers, he was not so certain about deep litter manure from the broiler house.

Wood splinters in the material were the main reason, with the carry-over of broiler feed drugs and toxic chemicals which were sometimes used to treat the wood shavings used for litter.

But its feed value, though of a lower energy level, was similar to barley, and the cost of drying manure

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*Continued from p. 13*

could be cut by pre-drying in deep-pit houses on wooden slats before passing through the drier.

Its potential in Britain.

Dr. Bolton concluded, could be estimated at an annual production rate for the country as a whole of one million tons.

#### **Bringing on The Bull**

Bulls should be bought two to three months before they are required to give time for them to be got into a fit conditions by the start of the mating season, according to Dr. B.G. Lowman, of the East of Scotland Agricultural College.

He has told farmers that special management is important for young bulls used for the first time, for they have often been reared well to achieve high 400-day

weights, are still very fat when sold and hence can be lazy workers and infertile.

Dr. Lowman says young bulls should never be turned in with large numbers of cows straight away, for they can easily become over-enthusiastic and over-work themselves.

Instead, they should be introduced gradually to the cows, spending only three or four hours with them at first and not allowed full access until at least one or two weeks later.

#### **Cold Colostrum**

The feeding of stale, cold colostrum to calves provides a cheap system of calf rearing, according to Mr. Keith Swannack of Bridgets Experimental Husbandry Farm, near Winchester in Hampshire.

Following unsuccessful attempts to freeze store colostrum, Mr. Swannack simply collected a can of colostrum, let it go sour, and discovered that the animals had no objections to it at all.

This means that given that a Friesian cow may give 10 to 14 gallons of colostrum during the first four days, her calf will drink only up to four,

Therefore feeding the ten surplus gallons at four pints a day will keep the calf for a further 20 days and if fed only to heifer calves, the excess could take them right up till weaning.

No ill effects have been observed with colostrum up to 100 days old, according to the report, with growth rates on the calves reared on it as good as those on whole milk or milk substitutes.

## FISHING

### ADVICE TO OVERSEAS FISHING INDUSTRIES

A team of consultants who have formed an advisory group plan to expand their overseas activities in the coming year.

The London-based organisation - Fisheries Development Ltd (a member of the Arbutnot Latham Group) advises on a

wide range of development aspects from feasibility and fish stock assessment, fish farming of all species including fresh water varieties through to harbour and port development. Product processing and marketing are also important aspects of the organisation's services.

The speciality services available from the company's staff and associated consultants include marine and civil engineering, fishing gear technology, vessel design, echo sounding techniques, and fish handling both at sea and on land.

As a non-government organisation the company is able to make unbiased recommendations and the procurement of equipment on a 'best buy for the job' basis.

The company believes its services will be in increasing demand as the international clamour gathers momentum for the setting up of 200-mile fishing limits around national shorelines. Many countries will be hoping to establish their own fishing industries to fortify their own national food supplies as well as for possible exports.

Apart from Europe the company has carried out projects in Thailand, Brazil, Portugal, Jordan and Panama during the past year.

(Fisheries Development Ltd., 37 Queen's Street, London EC4R 1BY.)



## FISHING TO FIGHT FAMINE

Here at the Shearwater Fish Farm - on a half-acre site amid the rolling hills of the English Lake District - British expertise is helping to produce half a million fish a year in a scheme which may go some way to alleviating the current world food problem.

At the Farm rainbow trout are reared in a controlled environment using a low dissolved oxygen concentration pumped into the rearing tanks. The use of oxygen minimises the amount of water required to produce such vast numbers yet allows for greater stocking densities. Controlled environment farming does not aim to produce the trout quicker than in a natural environment but the mortality rate of the young is cut from 80-90 per cent in nature to only 10-15 per cent in controlled conditions.

After the trout eggs hatch they are transferred to 60 inch (152 mm) fry tanks where they get their first taste of oxygenated water. As they grow they are again transferred to large covered tanks outside the hat-

chery where they are left to mature until ready for selling as food or as further breeding stock.

In this picture a research worker prepares to catch a specimen in one of the 25 feet (7.6 m) diameter tanks which hold up to 3 tons of fish - around 26,000 in number - in 6,000 gallons (27,265 litres) of constantly changing swirling water where they swim against the artificial 'tide' as in their natural environment.

At the Farm rainbow trout are reared in a controlled environment using a low dissolved oxygen concentration pumped into the rearing tanks. The use of oxygen minimises the amount of water required to produce vast numbers yet allows greater stocking densities.

'Eyed-Ova' - trout eggs with eyes of the embryo fish visible - are imported from many parts of the world and nurtured in shallow dishes arranged in racks around the hatchery. On hatching the fish are transferred

Continue overleaf

# ethiopia:

A decree on land reform was made public recently in Ethiopia. All land was proclaimed to be the property of the whole people. All land other than 10 hectares can remain for private cultivation on rural land announced by the Provisional Military Administrative Committee put an end to the age-old feudal system, and did away with the foundation for the exploitation of millions of tillers of the soil-private property in land. The radical, democratic nature of the reform showed that the new Ethiopian authorities have seriously tackled the job of breaking down the old system.

## WORLD FOOD PROBLEMS

protein technology - the first technology outside the U.S. to receive the Kirkpatrick Chemical Engineering award for advances in commercial applications of biochemical engineering.

Venezuela is constructing a plant to produce 100,000 tons of protein a year, while a similar plant run jointly with Italy is expected to come "on stream" this year (1975). BP has itself been operating two development plants - one producing 4,000 tons of protein a year at Grangemouth, Scotland, and another for 20,000 tons at Lavera, France.

## Regulations Satisfied

The BP product of high protein yeast from hydrocarbons to complement animal foodstuffs has already satisfied the strict regulations governing the safety and nutritional value of the agricultural departments of all Western European countries.

BP says: "On present estimates, proteins from traditional agricultural methods will become increasingly in short supply possible by some 20 million tons by the year 2,000. We believe that our technology in producing a high protein yeast from hydrocarbons on a commercial scale offers a major new animal feed source, which will help to relieve the pressure on the traditional food crop sources of protein and allow the crops to be used to feed people rather than animals".

*The Russian newspaper "PRAVDA" carried under this heading a dispatch by journalist Valentin Korovikov from Addis Ababa, capital of Ethiopia. The Novosti Press Agency offers a slightly abridged version of this article below:*

To get an idea of the full importance and revolutionary character of this reform, it must be borne in mind that for ages man's social status in Ethiopia was based on ownership of land, and was determined by the size of the possessions. If one has land, he has power. The might of the Emperor and the nobility was based on the possession of huge estates. Until recently Ethiopia remained a typically feudal and serfdom country with a poverty stricken and landless peasantry without any rights and a haughty, fattened top clique wallowing in luxury.

## Exploitation

Two main forms of the peasants' use of the land took shape historically

## FISHING TO FIGHT FAMINE

to fry tanks where they get their first taste of oxygenated water.

As they grow they are transferred to large covered outside the hatchery. Controlled conditions are maintained in these 25 feet (7.6 m) diameter tanks which have a capacity of 6,000 (27,275 litres) of constantly changing swirling water. In these tanks live up to 3 tons of fish - around 26,000 of them - swimming against the artificial "tide" closely resembling their natural environment.

This picture shows the racks of 60 inch (152 mm) controlled fry feeding tanks where the trout receive their first taste of oxygen injected water.

BOC SHEARWATER EQUIPMENT, Unit 7, Industrial Estate, Station Road, Southwater, Horsham, Sussex, England.

in Ethiopia. In the northern half of the country, inhabited mostly by Ambaras and Tigreans, the communal ownership of land remained. The ploughman had a right to a plot of the communal land on the basis of consanguinity or permanent residence. However, with the growth in the population these plots were split up until it became smaller and could no longer feed the owner of the plot and his family. Moreover, quite a good portion of the communal land was sliced over to the feudal masters, officials and churchmen, who resorted to various means to increase their land at the expense of the peasants. Forty-nine percent of peasant farmers in Begemder province have less than half a hectare of land, and another 44 percent from a half to 2 hectares. Seventy eight percent of the ploughmen in Tigre province have less than a hectare. And these are in areas where entire farm depends on cereal crops, i.e., the gross annual produce of the land owner amounts to several metric centimetres of grain, a hefty portion of which is taken off by tax collectors.

In the southern region of the land the Sidamo, Shoe, Arussi and other provinces most of the peasants had no land at all. In renting it, they had to pay huge duties. One of the articles of the old Civic Code permitted landowners to take from the lease-holder as much as 75 percent of the crops! Crown, the nobility, and high officials and in recent years also businessmen, grabbed millions of hectares of land. No one showed any concern for the fate of the peasants living on these lands from time immemorial. They automatically became lease holders of their own fields or

# land for the farmers

became farm labourers on newly created plantations.

Quite naturally, Ethiopia was in a state of complete stagnation due to such abuses. According to data from the UN Economic Commission for Africa, farm production in the country in 1971-1973 decreased annually by two percent. The suffering of the Ethiopian people became unbearable.

## MOMENTOUS CHANGE

That is why the agrarian reform proclaimed last March 4, is designated to play a decisive role in undermining the old system. It's main principles are: The nationalisation of land, no compensation shall be paid for land property, only people tilling the soil by their own labour can have plots for personal use, and the hiring of farm labour is not allowed.

The decree annuls the old debts and the lease holder's obligations towards the farmer landowners. Until the full redistribution of the lands all the lease holders and farm workers have the right of possession of the plots they had cultivated. The former landowner, if he lives in a rural area, shall receive the same plot as the rest of the peasants.

Special attention was given to the creation of peasant associations and their role. These bodies have to assume at district, area and province levels, with the assistance of repre-

sentatives of the administration, the main job in the implementation of the land reform. The main base of this network is the association of peasants or group of farmsteads with a land area of not less than 800 hectares. It is practically the first time in its long history that the Ethiopian peasantry (which makes up nine-tenths of the country's population) has been given the chance to participate in solving their vital national problems.

As far as large commodity farms are concerned, they will be made state property and will form the basis for the modernization of agriculture, and are to supply grain, beans, cotton, coffee, oil, seeds, cane sugar, meat, milk and other products for domestic needs for export.

The land reform has been received enthusiastically. Mass demonstrations in Addis Ababa, meetings, processions and folks celebrations swept the country. It is therefore understandable that the land reforms should cause dissatisfaction, and open resistance among the feudal interests and their successors. Quite a lot of smuggled arms are hidden in the estates and houses of the former ruling clique of Ethiopia. Some of the landowners still hope to remain in their estates playing

on the apathy and ignorance of the peasants. Reports have already appeared of the backlash of reactionaries. The feudal interests have no intentions of giving up their lands without a fight. The new rulers and all the democratic forces of the country face a difficult job in uprooting the feudal system and replacing it with a new truly Ethiopian system.

Bearing in mind that, never in history have radical changes entailing, the break down of old, moribund foundations proceeded easily and smoothly. Stumbling blocks still lie ahead for the people of Ethiopia. The successful implementation of the land reform will be one of the decisive stages on the difficult road of progress for the country of 28 million people.



*Specialists of the North Research Institute of Hydro-Engineering and Land-Improvement in Leningrad are testing instruments for new irrigation systems.*

transform plant materials into still other products of use to man; meat, hides, wool, eggs and milk. The growth of plants and animals goes on in nature without any participation by man. Thousands of kinds of plants have evolved over time in different parts of the world in response to differences in sunlight, temperature, amount of available moisture, and the nature of the soil. Each kind of plant has its own special requirements. It grows best with a certain

Agriculture must vary markedly frequently within short distances the near future to be able to react rationally, except in greenhouse agriculture could, existing soils are the under various past climatic conditions in climates and soils call for to differences in local environment

growing season, certain temperatures at different stages of its growth, a certain amount of moisture, and certain soil characteristics.

The plants that grow in a particular region determine what kinds of animals, birds and insects live there, since some of these feed on the particular kinds of plants found in the region, while others feed on each other. As a result, different combinations of plants and animals are found in different parts of the world. Sometimes, particularly where the land is hilly or mountainous, these combinations are different within very short distances because of pronounced differences in temperature, direct sunlight, moisture and soil conditions.

Agriculture arises when man begins to take control

# the elements of AGRI CULTURE (I)

by Our Farming Correspondent

first step toward agriculture moving achieve a clear and understanding of what nature is.

culture is a special production based on growth processes of and animals. Farmers and stimulate plant animal growth on

production activities farm are a business costs and returns

are important.

The Production Process  
The Farmer  
The Farm  
The Farm Business

## The Production Process

Plants are the primary factories of agriculture. They take in carbon dioxide from the air through their leaves. They take in moisture and chemical

substances from the soil through their roots. Out of these, using the energy of sunlight, they make seeds, fruits, fibers and oils that man can use.

Livestock are important secondary factories of agriculture. Depending on plants for their food, they can eat many parts of plants that man does not, such as the stems and leaves of grasses. They

of this growth of plants and animals, rearranging it to his own benefit. The difference between primitive and scientific agricultures lies in the degree to which this control has advanced.

In the most primitive agriculture, man accepts the soil, the rainfall, and the local strains of crop plants. He fosters the growth of these plants by eliminating to some degree the competition of other plants for the available sunlight and moisture.

from place to place. We are not likely in any climates substantially. Even if we have the result of long evolution. The differences between different crops, adapted to...

He tries, by primitive methods, to protect his crops from wild animals, birds, and insects. He domesticates certain animals taking care of them and using their products.

In a scientific agriculture he applies his ingenuity to increasing his control over all the factors that affect plant and animal growth. He introduces irrigation and drainage. He adds plant nutrients to the soil. He breeds modified plants that are more resistant to disease, that utilize large amounts of fertilizers, that are resistant to drought, that mature more quickly, that yield more of the particular products he wants. He develops scientifically prepared methods for his livestock and scientific methods to protect them from disease.

AGRICULTURAL APPARATUS



An original device for determining the time for watering farm crops was created at Hydraulic Engineering and Land Reclamation Institute in Turkmenia (republic in Central Asia.) This is outwardly a small vessel with a scale showing the moisture content. It has a loose "mush room" whose head serves as a vapourizer while its "roots" are immersed in the vessel. The device evaporates moisture synchronically with the soil and, having been "tuned" ahead of time for a definite farm crop, gives a timely warning about the need for watering the soil again.

The signalling device is one of the links of future automatic systems that will find application on the republic's farms. Such systems are being developed by Turkmenian scientists now.

The instruments included in the system will report on the need for watering the crops to

the control room or will give the signal to switch on the water directly at the pumping station. But they can also operate independently of any system. In this case the waterers have to watch the instruments and switch on the water themselves.

Now the automatic signalling devices are undergoing production tests on the republic's farms and have already gained favour with practitioners. Their introduction will greatly lighten the work of the waterers, and will create the possibility for the effective management of irrigated farming in the conditions of Turkmenia's hot climate.

In this picture, the author of the invention Vladimir Gafurov, scientific worker at the Hydraulic Engineering and Land Reclamation Institute in Turkmenia, sets up the automatic signalling device for watering an alfalfa field.



FARM TRAINING FOR NIGERIAN

The intricacies of the electric milking machine now hold no secrets for Mr. Umaru Abubakar Zango, a Nigerian technician on a one-year course in Britain studying arable farm management and farm machinery.

Mr. Zango, 32 and senior assistant technician in the agronomy department of the Institute of Agricultural Research, Samaru, Zaria, Nigeria, is currently studying at the Lindsey College of Agriculture, Lincolnshire, in Eastern England. He is also looking at some of the most technically advanced farms in Britain, involving the growing of potatoes, onions and the processing of sugar beet and potatoes.

The Lindsey College has its own herd of Friesian cattle, a breed used in Nigeria, and Mr. Zango is gaining practical experience in feeding and milking.

Certain characteristics of the biological production process of agriculture and beyond our control. We cannot change its dependence on the energy of sunshine or its variation with the seasons of the year. We cannot eliminate the great diversity of the many combinations of climate, topography, and soil that favour the growth of different types of plants and animals.

And yet, although man did not invent and does not fully understand the process of plant and animal growth, he has learned a great deal about them and has discovered many ways to control them for his own benefit. We are discovering new ways all the time through scientific research. This increasing knowledge provides the technical basis for the changes that add up to agricultural development.

Implications for Agricultural Development

Several important implications for agricultural development follow directly from the nature of the biological production processes of agriculture.

Agriculture must remain widely dispersed. Because the energy for plant growth comes from sunlight, agriculture cannot be concentrated in urban factories that can have their energy brought to them in the form of fuels or electrical energy. Agriculture will always require large areas of the earth's surface on which sunlight falls.

This means, first of all, that a widespread transportation network is necessary for scientific agriculture, to take improved seeds, fertilizers, pesticides, and other modern production supplies and equipment to the various parts of the wide expanse of fields exposed to sunlight, and to bring agricultural products to markets.

Another consequence is that farmers cannot be moved out of their family and village setting into a more controlled "production environment".

In non-agricultural industry, workers can be assembled in urban factories away from the places where they live. In agriculture, the changes necessary to increase productivity must be carried on in the midst of traditional family and village influences.

In contrast to the concentrated nature of cities and factory work, agriculture needs space to take advantage of soil and sunlight.

Agriculture must vary markedly from place to place, frequently within

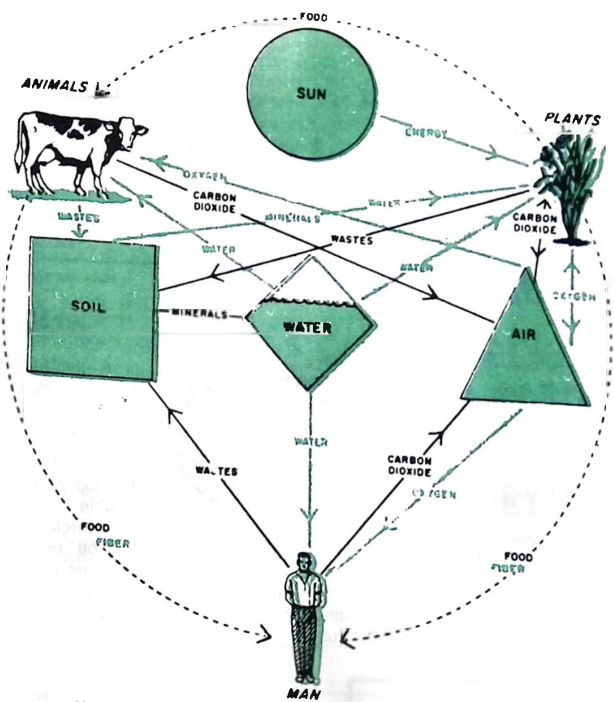
short distances. We not likely in the near to be able to modify mates substantially except in greenhouse culture. Even if we existing soils are result of long evolution under various past conditions. The differences in climates and soil for different crops, to differences in environments.

In a few exceptional regions of the earth conditions for plant growth reasonably uniform large areas of agricultural land. Delta; the Corn Belt United States; the Region of Russia; regions of Thailand, Burma, the Philippines, Malaysia, the regions of Brazil, and East and West the grasslands of Uruguay, and the of Asia - are such regions. One of these the is usually far from

Minor differences: and topography in rent crops and systems most

Other regions more varied. Distances within a hundred differences in hilly country, direct sunlight ratures call for crops in order best use of resources.

Thus a small Japan may be with vegetable and fish culture North India intensive irrigation near a well dry-land farm hundred yard-farm in the



Colombia may have one kind of crop on well-drained fields and another kind on a nearby field that is marshy.

"plans" or with managers of large "collectives" fall far short of expectations. It is only where natural conditions are very uniform that large farms or plantations, with one manager directing the work of many "labourers" can match the efficiency of good individual farmer-operators of much smaller farms. Such uniformity of natural conditions is the exception rather than the rule.

regions elsewhere in the world. But the importance of minor variations in soils and climates even in regions that seem similar means that crops or methods imported from other regions, or even from elsewhere in the same region, require careful testing to make sure they would prove satisfactory if adopted locally.

subject to weather and to other factors such as the incidence of insect pests or diseases that vary from time to time and from place to place.

These differences have important implications for agricultural development. Perhaps the most important is that they call for such close adaptation of crops and methods to varying local conditions that only the individual farmer can have the specialized knowledge of his farm necessary to make intelligent decisions about its use.

Another important implication is that hints as to how the agriculture of a region can be improved can frequently be found by looking at the agriculture of other farms in the same region or at those in similar

The timing of farming operations must be fitted to weather conditions and to attacks by pests and diseases. Factory production processes are carried on under controlled conditions that permit each operation to be performed at any time and all the time. Agricultural production, on the other hand, is

Some operations, like ploughing can be done only when weather and soil conditions are right. Other operations, such as pest control, must be carried out quickly if a crop is threatened with destruction. Thus many agricultural operations cannot be rigidly scheduled in advance or from a distance. Schedules must be left flexible for on-the-spot decisions by each farmer, based on local conditions at the time

## POULTRY

The first few weeks of chick's life are her most important. Most poultrymen devote a lot of care to their chicks during this time. However, despite good care, poultrymen can run into trouble during this period.

Look at some of these experiences. Let them help you prevent trouble and increase your egg profits.

### PREVENT LITTER EATING

On harried poultryman reported his chicks dying one after another. Examination showed the chicks' gizzards packed with shavings. His chicks lived in battery for a few days after hatching. When the poultryman put them on the floor, the chicks ate litter and died.

your  
**CHICKS**  
want a good start



If litter is "bite-sized", cover it with paper for a few days. This allows the chicks to learn to eat from feeders. After you remove the paper in a few days, they recognize feed and won't confuse it with litter.

### ADD GRIT SPRARINGLY

A poultryman brought some chicks to a laboratory. Some were weak, some had died. Grit packed their gizzards.

Sprinkling a small amount of grit on top of the mash helps avoid this trouble. Don't use a lot of grit until the chicks learn where to find feed. If you restrict feed on your flock, continue periodic grit feeding. Chicks can digest mash or crumbles well without grit. But if they happen to eat some pieces of litter, grit may help grind those pieces so they pass on through the intestine. Begin feeding hen-size grit when the chicks reach seven or eight weeks of age.



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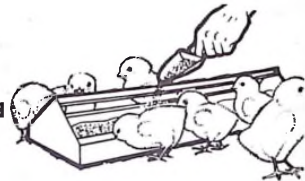
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**Don't Feed  
Too Much  
Grit**



### PLENTY OF FRESH AIR

One poultryman closed his bro house up tight one cold night. During the night, the gas stove died. So some of his chicks. There just enough oxygen to keep the chick the burner going. By morning filled the house and was ready to explode.

Chicks and stoves must have oxygen. Allow air to move through your brooder house at all times may reduce ventilation in cold weather but don't cut it off. Chicks need ventilation all the time. As long as your chicks can find a warm



under the hover and their water does not freeze, they can stand cold rooms for brooding.

Chicks would rather have fresh, cool air than warm, stale air. Poor ventilation during brooding causes many losses. Keep air moving. Watch chicks and feathers grow rapidly in cool, well-ventilated brooding rooms with comfortable warm hover areas available. Ventilation also helps keep litter dry, reducing chances for coccidiosis and mold growth.

start. If he moves too cautiously around the chicks, he will always have to be cautious.

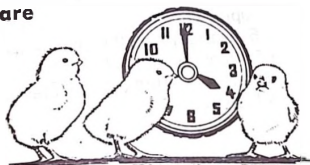
It is good for birds to learn to eat together at the feed trough. Usually this makes picking less of a problem. Birds need enough feeder space so all can eat at once. Feed birds two or three times a day. If birds are a little hungry when fed, they all eat quickly.

### Teach Birds To Eat Together



Continue overleaf

### Give Birds Regular Care



### REGULAR CARE

Poor ventilation, not enough feeders and waterers, overcrowding, disease, and other poor management factors may lead to stress in a flock of birds. A little stress may harden a flock to ward off future attacks, but too much stress can permanently damage the birds.

Good, regular care discourages the build-up of stress factors. Regular care can help birds develop good habits to they get along well with each other, without picking, and with people, so they are not frightened when someone looks at them. The attendant should move around normally right from the

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# MITCHELL FARMS

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... level in the feeders  
... save several pounds of feed  
... raised.

... feed falls into the litter,  
bacteria and molds contaminate it and  
multiply. Worm eggs and coccidia mix  
with the feed and chicks get sick when  
they eat it. Low level feed, correct  
feeder size and height help prevent  
this and saves feed as well.

One puzzled poultryman wondered  
why his chicks stayed so far away  
from the hover. His thermometer said  
93 degrees - and the chicks were three

... He discovered a draft blowing  
about a third of the way across the  
room. The oil brooder stove created a  
movement of air up the chimney, and  
the "replacement air" came in the only  
place it could - under the door.

The poultryman put a step-over  
board across the doorway and card-  
board chick guard around the hover.  
He stopped the draft without ruining  
ventilation and solved his problem.

### CLEAN UP REGULARLY TO CHECK DISEASE

Many a poultryman has learned, to  
his dismay, that good sanitation pays.  
Clean out and disinfect your brooder  
house. Remaining disease germs may  
affect the new chicks severely. Keep  
the birds out of contact with old  
manure. Put them on clean ground if  
you range your birds. Keep them away  
from places where older birds have  
been recently. This helps keep dis-  
ease germs and parasites out of the  
young folk. These organisms cause  
some damage and lower performance  
in the laying house later.



### FOR BEST RESULTS, OBSERVE THESE TEN MANAGEMENT SUGGESTIONS:

- 1 Each chick needs at least 7 ins. (20cm) to 10 ins. (25cm) square inches of brooding space under the hover. If you brood chicks under individual brooder stoves or units, allow a maximum of 500 chicks per 6-foot (2m) hover or 750 per 8-foot (2.5m) hover.
- 2 Give chicks reared in confinement at least 1/2 (15cm) square foot of brooder room floor space per bird through six weeks of age.
- 3 Chicks day old through 6 to 10 weeks of age should have 2 inches (50mm) of feeder trough space or equivalent per bird. Count both sides of the feeder

trough. For example a trough  
one foot long provides two feet  
or 24 inches of trough space.

- 4 Chicks day-old through 2 weeks of age require 20 linear inches of water space or 2 one-gallon fountains per 100 birds. From 2 weeks to 10 weeks of age, provide 1/2 inch. of trough space or equivalent per bird.
- 5 In cold weather, use a solid chick guard around the hover to keep chicks from straying and to stop floor drafts. Wire guards work fine in warm weather.
- 6 Start with chick guard 2 or 3 feet (1m) from edge of hover. Gradually expand it. Remove at the end of 1 week.
- 7 Provide roosts for the replacement chicks by 4 weeks of age, especially if roosts are to be used for hens. Allow 4 ins. roosting space per chick from 4 to 10 weeks of age.
- 8 Spread at least 2 inches of suitable litter on the brooding house floor. Cane pulp, shavings, sawdust, crushed corn cobs, chopped straw, peanut hulls, peat moss and other materials may be used when free from dust. Change litter from each new brood of chicks.
- 9 Use all night lights the first couple of days, equivalent to 15 watts per 200 square feet of floor space (about 14 foot square). This helps prevent pile-ups.

### PLEASE REMEMBER:

Use enough feeders for all your chicks to eat at one time. As you

Use enough feeders for all your chicks to eat at one time. As your chicks get older, use more and larger feeders. Feeding several times daily helps develop good habits of eating together.

Two waterers per 100 chicks with clean, cool water, help keep chicks healthy. Add more waterers as your chicks grow older. If necessary, use disinfectants in the water to kill bacteria. Some disinfectants make cleaning waterers easier. But don't substitute disinfectants for regular cleaning.

Keep your chicks healthy while the grow - and they'll pay you bigger dividends when they go into the laying house.

### Brood Chicks Far From Hens



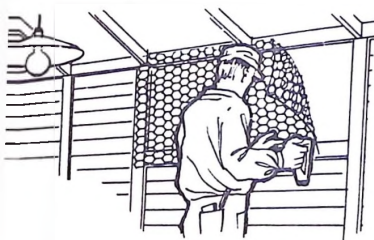
days old. They acted okay in the morning when the thermometer said 75 degrees. But that was too cold, he thought, and turned up the thermostat.

A later thermometer check showed the instrument off 18 degrees. When the thermometer registered 93, the temperature actually hovered around 111. No wonder the chicks stayed away from the hover.

This could have worked in reverse, too. Check your thermometers for accuracy before you trust them. At any rate, watch the birds more closely than the thermometer. They'll let you know whether they're comfortable or not.

A meticulous poultryman stopped up all the cracks in his brooder house to prevent drafts. He missed one - the crack under the door. He noticed the chicks close to the door looked a little less than frisky - and they looked

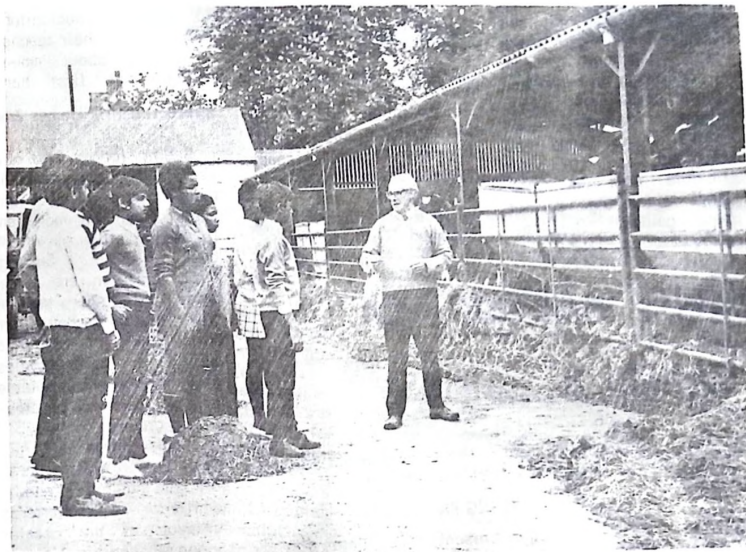
### Keep Wild Birds Out



## FARMS ARE NOT WHAT THEY

## USED TO BE

by  
Ruth Elliott



Schoolchildren on a days visit to a farm listen to the farmer explaining the techniques of dairy farming.

Watching people at work though a time honoured pastime often causes a major disturbance to the people being watched. This is particularly true of farms and farming. Not many farmers can cope with visitors in their farmyard among expensive and often potentially dangerous machinery or eager beavers trampling down young plants in fields and vegetable gardens as they exclaim joyfully over colourful poppies or cornflowers on an

a nest in the hedgerows. It is partly because many townspeople still have a romantic picture book view of life on the farm in the 1970s that the Countryside Commission in Britain is now

investigating the possibility of setting up permanent Farm Centres which can be freely visited by schoolchildren and other members of the public.

Primarily outings to such Farm Centres are intended to be educational but they could also become an acknowledged leisure activity the equivalent of spending a day on a farm.

### A Bout Of Nostalgia

Farming in Britain today is not so much a slow moving, rustic activity as a major industry. Few people would think of taking their families round a factory or laboratory, but many people get a bout of nostalgia when they think

of spending a day down on the farm.

Hilary Tinley at the Association of Agriculture has been involved for some years in the setting up of the popular Open Days on farms which are already introducing townspeople in all parts of Britain to the realities of life on a modern farm.

A farmer's daughter, and a trained dairy farmer herself she has now lived in London long enough to understand why townspeople often know so little about the countryside.

Farm Open Days were launched after a previous study by the Countryside Commission, which investigated not only the potential demand for such facilities but the best way of meeting it. There is always a danger that "each man destroys the thing he loves" to the point where crowds of enthusiastic visitors can turn a farm into a showpiece where the provision of facilities for sightseers overshadows the real purpose of the place.

*Continue overleaf*

### Working Farm

Over 120 farms now have official Open Days and more are on the way. In the main these Open Days are organised at weekends so that parents and children can go together. Farm outing are also very popular with scouts and guides.

The emphasis is always on demonstrating a real working farm, including aspects which townspeople may not often consider - tractors and combine harvesters,

machinery used for milking and corn drying, battery hens and commercial bacon production.

Visits like these are a long way from the children's image of the toy farm they played with in the nursery, or even the real farm on which their parents may have grown up a generation ago.

Following on Farm Open Days came Farm Trails. These are prearranged walks round farms and farmland and are more flexible than the Open Days since they do not need guides. The foot-

paths are equipped with leaflets or noticeboards designed to nudge walkers into noticing what might otherwise escape the untutored eye: a field of spring barley on one side, a herd of Herefords grazing peacefully on the other.

It is a good way to learn about the countryside and to see for yourself that farming is not just a matter of putting seeds into the ground and waiting for things to grow. Fertilisers and insect sprays are as much part of modern farming as balance sheets and imported feedingstuffs.

Now the movement for more contact with farms and farming communities is growing rapidly. Some local authorities in the county of Derbyshire in northern England, and even in the Greater London area, are already running working farms as Farm Centres to which schoolchildren can go with their teachers to learn about modern farming at first hand.

### Where The Milk Comes From

Seeing for yourself is a very contemporary teaching method; a visit to a Farm Centre can be more enlightening than a whole book about farming. Town children are sometimes astonished to discover that milk comes from cows and not from the dairy, or that apples grow on trees and potatoes in the ground.

"Of course it is not ideal to run a farm as a sort of museum piece," admitted a chartered surveyor in the Greater London Council's Valuers Department who is responsible for one of the Farm Centres. "The main problem is to keep the farms as typical as possible."

To this end he already visualises overhead walkways for visitors, maybe viewing galleries overlooking the herring bone milking parlour and special pre-tour briefing for the teachers in charge. Some purpose built features like special building for displays, or even demonstrations of manual milking, may also be recommended.

The main problem facing the planners is to ensure that instruction and relaxation arrangements in Farm Centres do not spoil the essential character of the farm.

## THE YOUNG MASTERS OF THE FIELDS & FARMS

by APN Correspondent, Moscow.

Today young people in the countryside can do a lot of things which older people have never done in their life. They now know how to work out a ration for cattle with the right portion of proteins and tracer elements, they can test new varieties of plants.

There are close to three million children in the Soviet Union who are members of youth production teams.

In the past peasants had individual plots and cattle. This was regarded as a great help in their life, so the parents taught children on their own initiative how to cultivate land and take care of domestic animals. At the present time individual economies are playing a very insignificant and diminishing role. The more sighted school teachers together with collective farm management and Komsomol organisations have decided to set up children's teams. They have allotted plots of land to these teams, and appointed instructors. They have provided them with sowing machines and equipment,

seeds, etc. The drive brought fruit within the first few years, and plenty

### YOUNG PRODUCERS

At the present time there are dozens of thousand of children's production teams all over the Soviet Union, and they sow cereals, grow vegetables, and take care of the young cattle. These teams practically train skilled personnel for agricultural production. Many of the children's team have proved very helpful to research institute, and actually fulfil the duties of experimental stations. Research continues several years. The children test new varieties, analyse the effects of different weather conditions, frost, rain, snow.

The children learn to manage agricultural production economically. They study machines, agrochemistry and animal physiology.

Work in the teams does not limit the children's choice of future profession. The teachers, it is true, are trying to orientate them to working in their native places, the more so that the Soviet village today can offer practically any kind of occupation.

In order to help students preparing for examinations in Agriculture, we publish below this year's syllabus for the West African School Certificate at both Ordinary and Advance Levels.

# WEST AFRICAN SCHOOL CERTIFICATE & G.C.E SYLLABUS

## AGRICULTURAL SCIENCE (ORDINARY LEVEL)

*Candidates can be accepted for this subject only in accordance with regulations G.1(2), 1(3) and 5(3).*

The Science syllabuses have been prepared on the assumption that the course will be based on practical work, and considerable weight is given, in the marking schemes, to the practical examinations. In order to ensure that passes in Science subjects are not awarded to students whose knowledge is obtained from books alone, no school may enter candidates in any Science subject unless it has been specifically recognized for that subject by the appropriate Ministry of Education. The Council reserves the right to inspect such schools. The Council does not attempt to prescribe a course of experimental work or even the number of periods to be spent in carrying out experiments since it does not wish to interfere with the freedom of schools in these matters. Candidates who have left school not more than a year before the date of the examination may be permitted by the Head of the school, at his discretion, to enter as school candidates.

4(3)

Schools seeking recognition for a specific Science subject (or subjects) must apply to the appropriate Ministry of Education for such recognition by 30 June, two years before the examination for which recognition is sought.

AND 5(3)

Private candidates can be accepted for Agricultural Science, Biology, Chemistry, General Science, General Science (Additional) and Physics only

if (i) they have spent three years at a school recognized for these subjects, and (ii) they produce, when they enter, a certificate from the Head of their former school establishing this fact and stating that the Head is prepared to offer laboratory facilities during the examination.

Candidates offering Agricultural Science will be required to offer, in addition, General Science or Biology and Chemistry.

When Agricultural Science is taken together with General Science or Biology and Chemistry at the same examination, a pass may be awarded in Agricultural Science irrespective of the candidate's performance in General Science or Biology and Chemistry.

There will be three papers all of which must be taken:

PAPER 1 will be a 1½ hour practical paper.

PAPER 2 will be a 1 hour theory (objective) paper.

PAPER 3 will be a 2 hour written paper consisting of four sections.

There will be three questions in section A two in each of the remaining three sections B, C & D.

Practical work should form the basis of preparing for this subject. Candidates will be required to submit their PRACTICAL FIELD NOTEBOOKS for which marks will be awarded.

## DETAILED SYLLABUS

Candidates will be expected to answer questions on the topics set out in the column headed 'Syllabus'. The rates are intended to indicate the scope of the questions which will be set but are not to be considered as an exhaustive list of limitations and illustrations.

It is desirable that schools presenting candidates for Agricultural Science should keep a School Farm, but where this is not possible, a well planned garden with small plots of farm crops off regular observation during growth is essential. At least two species of livestock, preferably one monogastic e.g. pigs, poultry, and one ruminant e.g., sheep, goat, cattle or a herbivore e.g. rabbit, guinea-pigs must be kept. The Practical Field Note Books of the candidates should contain records of individual projects, farm activities and observations carried out on the school farm or garden.

It is also recommended that the study of Agricultural Science in the School Campus be supplemented by visits to well organized farms and/or Agricultural Research Stations.

## SECTION A: INTRODUCTION TO AGRICULTURE

### SYLLABUS

1. The meaning and importance of Agriculture.

*This should involve a discussion of the importance of Agriculture to man generally and its role in the economy of the relevant West African country, emphasizing that agriculture is a business.*

2. General principles of land use,

*This should be discussed in relation to the use of land for Agriculture, Forestry and wild life conservation purposes, bearing in mind the physical, economic and social factors, commercialisation, communication and marketing.*

3. Agricultural Systems: land tenure problems; shifting cultivation, crop rotation; continuous cropping, monocropping, mixed-cropping, pastoral and mixed farming.

4. Development of Agriculture: role of science and technology in development of Agriculture, including tools and source of farm power, Problems of development of local Agriculture.

Role of Government-Agricultural policies, regulations and programmes. Agricultural education, research and extension, credit facilities.

subsidies.

quarantine, vaccines and farm settlement schemes.

5. Simple farm tools and Agricultural machinery: their uses and maintenance.

*Engineering details should be avoided.*

6. An elementary study of climate with particular reference to its effects on Agriculture. The main types and ecological distribution of crops (cereals, legumes, roots, vegetables, edible fruits, beverages, spices, drugs, oils, gums, latex, fibre); and animals (cattle, sheep, poultry, rabbits) found in West African countries.

7. Use of Agricultural and Forest products and their by-products.

*The discussion should include the use of agricultural and forest products for the provision of*

- (1) Food: fresh and processed;
- (2) Clothing: hides and skins, fibre, rubber etc ,
- (3) Shelter: Timber, gums, resins, etc
- (4) Health: Drugs;

- (5) Fuel and Power: oil, minerals; and
- (6) Others.

## SECTION B: SOIL SCIENCE

1. Soil formation and properties: rocks-main types, rock weathering and factors of soil formation. Composition and properties of the soil, sand, silt, clay, organic matter; soil acidity. Soil texture and structure, and their importance. Water-retaining properties of humus and clay.

*Different soil types should be handled and the separation of a soil into sand, silt and clay fractions demonstrated. Water-holding capacity and drainage of a sandy soil, clay and soil with a high percentage of organic matter should be simply demonstrated by these soils in funnels.*

2. Soil and water conservation: depletion of soil resources by leaching, cropping, burning and oxidation of organic matter, erosion—its importance, causes, prevention and control—irrigation and drainage.

3. Soil fertility: plant nutrients; major sources of nitrogen, phosphorus and potassium. Maintenance of soil fertility; crop rotations, including cover crops and green manure; the living population of the soil and

its role in the carbon cycle (especially Earth-worm and Termite) and nitrogen cycle (especially nitrogen fixing bacteria); the use of commercial fertilizers and lime; the principles and practice of cultivation and their effects on soils.

## SECTION C: CROP SCIENCE

1. A review (with emphasis on their Agricultural implications) of plant parts, their functions, growth, development and reproduction.

2. Annual and perennial crop plants: external morphology, life-history, propagation, growth, cultivation, harvesting, storage, marketing and uses of local crop plants. Minimum of two

crops from each of groups 1 to 6 should be selected from the list in the Appendix table below.

*Where there are two or more types in each group not more than one member of each type should be studied.*

3. Pastures and forage crops; recognition and study of main grasses and legume species commonly used in pastures. Natural pastures and their distribution. Important forage grasses and legumes and their uses

*Detailed botanical studies are not required. Students will be expected to recognize on the basis of gross morphological appearance, at most for species of grasses and at least one species of legume used in pastures.*

4. Crop improvement: aims, methods, introduction, selection and cross-breeding.

*Chromosomes and Medel's 'Laws' need not be treated in detail. A brief study of sexual and asexual methods of crop improvement. A comparison of a local variety and an improved variety of a crop plant can be made for demonstration.*

5. Weeds: their importance in Agriculture. Recognition of common annual and perennial weeds of local importance. Methods of dispersal and control of weeds.

*Herbicides can be mentioned but not details of chemical structure and mode of physiological action should be dealt with.*

6. Disease: a simple general account of diseases caused by fungus, bacteria, nematodes and viruses and nutrient deficiencies affecting crops. The nature of the damage, methods of transmission and common methods of control.

*Microscopic recognition of the causal organisms may be demonstrated where feasible.*

7. Pests: a general account of pests of crop plants and stored products, their types and importance; principles and methods of pest control.

*Study should include a general account of pests including rodents, birds and insects. An account should also be given of the life-cycle of a biting insect, e.g. grasshopper, a boring insect, e.g. a weevil, a sucking insect, e.g. an aphid.*

## SECTION D : ANIMAL SCIENCE

1. A review (with emphasis on the Agriculture implications) of the organs and tissue of animals and their functions.

*A discussion of various species of domestic animals, their uses, and the common breeds (exotic and local) of each of the species.*

2. Farm Animals: purposes of their production. Types and economic value of domestic animals locally produced

3. Elementary study of Animal Nutrition: Functions of carbohydrates, fats, proteins, minerals and vitamins. Feeding stuffs—sources of main nutrients; balanced rations; maintenance and production rations; malnutrition in farm animals.

*Details of formulation of diets and bio-chemical details of these major nutrients are not required.*

4. Reproduction in farm animals; heat period (oestrus); a general outline of the development, nourishment, respiration and birth of the young. Mammary glands; milk; lactation; egg formation; weaning of young.

*Details of cell division and of the anatomy of the early embryo and the formation of the foetal membranes are not required*

5. Study of one animal from each of the following groups; study including the main aspects of general management, feeding and breeding.

(a) cattle, sheep and goats;

(b) pigs, rats, and dogs;

(c) rabbits, guinea-pigs, horses donkeys;

(d) chicken, ducks, turkey, guinea-fowl.

6. Animal improvement: aims, methods: introduction, selection and

cross-breeding (including the use of artificial insemination).

*Chromosomes and Mendel's 'Laws' need not be treated in detail. Comparison of a local breed and an improved breed of animal can be made for demonstration purposes.*

7. Diseases: a general account of important diseases in farm animals. Control: preventive and remedial measures.

*Local examples should be emphasized*

8. Pests and parasites: insects and ticks and carriers of disease in farm animals. Life-history of one endoparasite of farm animals, e.g. ticks or lice. The principles and methods of control of pests and parasites of farm animals.

*Details of structure are not required.*

## APPENDIX TABLE

### APPENDIX TABLE

List of annual and perennial crops (See SECTION C. 1.2 of Syllabus).

Group 1. Cereals: maize, millet, rice, guinea corn, wheat, tamba, acha.

Group 2: Legumes: beans, cow peas, groundnuts, soya beans, bambaragroundnuts, . yams beans, pigeon pea.

Group 3: Roots, tubers and vegetables: cassava, yams, cocoyams, potatoes, onion, charlots, pumpkins, tomatoes, carrots, okro, spinach, vegetable jute, lettuce, cabbage, cauliflower.

Group 4: Edible fruits and nuts: avocado pear; bananas, citrus fruits, guavas, mango, jackfruit, pawpaw, pineapple, cashew, watermelon.

Group 5 Beverages, spices and drugs: cocoa, coffee, colanut, peppers, benni-seed, ginger, sugar-cane.

Group 6 Oils, latex and fibres: coconut, cotton, oil palm, shea butter, sun-flower, sesame, rubber, sisal kapok, jute, hemp.

## PRACTICAL AGRICULTURAL SCIENCE

One hour and a half will be allowed for the practical test which can be taken in an ordinary classroom. The principal aim will be to test skill in observation and recognition. The practical note book covering the work of the entire syllabus, field work farm diary and project work will be examined and assessed.

NOTE It is assumed that candidates will have gained adequate experience of every practical aspect of the entire syllabus.

1. Soil samples, rocks, and fertilizers.

*Soil samples to be examined for texture by feel only, acidity by simple tests. Common rock types of igneous, metamorphic and sedimentary origin. Soil profile description. Recognition of common types of fertilizers and manures.*

2. Growth, habitat and form of plants and animals studied as listed in Appendix Table (Groups 1 to 6) and sub-section 5 of Section D of the syllabus.

*Recognition of parts and whole of the crop plants and farm animals studied.*

3. Main pests and diseases of crops.

*Recognition of main pests, their damage to crops, e.g. cotton stainer stem borers of cereals, weevils of grains and yam beetle. Recognition of main diseases of crops and their causal agents where feasible with characteristic symptoms, e.g. smut of cereals, maize rust, swollen shoot of cocoa, mosaic of cassava rosette and leaf-spot of groundnut, blast of rice and brown-rot of pineapple, nematodes of crops, parasitic seed bearing plants such as dodder and mistletoe, and nutrient deficiency symptoms.*

4. Seeds, fruits, food storage organs and other parts of the main plants and local weeds.

*Recognition of the structure of seeds and fruits of the main crop plants and of weeds in relation to the mode of their dispersal.*

## 5. Tools

Recognition of common hand tools, e.g. cutlasses, hoes, forks, mattock, trowels, rakes, budding knives, shears, secateurs, chain measurer, sprayer etc. and their uses and maintenance.

## 6. Animal feed-stuffs.

Recognition and comments on the use of main animal feed-stuffs, e.g. palm kernel meal, blood meal, bone meal, maize, guinea corn, groundnut cake, fish meal and common forage crops, e.g. guinea grass, elephant grass, giant star grass, andropogon, calopogonium, pueraria, centrosoema and stylosanthis.

## 7. Main pests and parasites of farm animals.

Recognition of main ectoparasites and endoparasites of animals, e.g. ticks, lice, tape-worms and round-worms, recognition of ill-health symptoms.

## AGRICULTURAL SCIENCE

### (ADVANCE LEVEL)

The syllabus that follows, has been designed to portray Agricultural Science as an applied science with emphasis not only on the depth of but also in the acquisition of skills that are associated with the theory. It is therefore essential that candidates should make field trips to farms in different ecological areas and game reserves within the country, and

in different ecological areas and game reserves within the country, and should be exposed to the major products of the forest types in their country.

The syllabus has been designed to meet the needs of private candidates as well as those of school candidates. Candidates who wish to do a University course in Agricultural Science are advised to offer along with this subject at Advanced level some other science subjects which may be necessary for entry requirements of the Universities.

It is desirable that candidates should have reached Ordinary Level standard in at least one of the following subjects:

Agricultural Science, Biology, Chemistry, Physics, General Science and Additional General Science.

The examination shall consist of three papers all of which should be taken.

### PAPER 1

2 - hour theory paper divided into three sections.

Section I: General Agriculture (5 questions).

Section II: Agricultural Economics (3 questions).

Candidates shall be required to answer four questions including at least two from Section I and at least one from Section II.

### PAPER 2

3 - hour theory paper divided into three sections.

Section I: Soil Science (4 questions).

Section II: Crop Science (4 questions).

Section III: Animal Science (4 questions).

Candidates shall be required to answer two questions from each section.

### PAPER 3 (Practicals)

A Farm Project to be assessed in the second term of the year of examination; and carrying 1/3 of the maximum marks for the practicals.

#### PLUS a 3-hour practical paper.

Note: (1) The content of the syllabus for the Practical exams could be examined in the theory papers and vice-versa.

(2) Paper 2 alone may be offered as a Subsidiary Paper for H.S.C.

(3) Farm Project

The Farm Project would be assessed by an examiner of the Council. The Project Work would be inspected in the 1st term of the 2nd year or when the Project is at its peak. Schools will therefore be required to inform the Council of the Project Work being carried out by the students at the end of their first year.

### DETAILED SYLLABUS

#### A. General Agriculture

##### 1. Introduction

(a) Meaning and importance of Agriculture.

(b) Factors that determine the pattern of agriculture-ecological and sociological basis: ecological distribution of crops, animals and forests.

(c) Agricultural systems: principles and practice of cultivation nomadism, shifting cultivation, mixed cropping, crop rotation and mixed farming.

(d) The contributions of Agriculture to the national economy.

##### 2. Development of Agriculture

(a) Problems of subsistence agriculture-land tenure, education, health services, communications, soil erosion, transportation, attitudes, poor tools, government agricultural policies.

(b) General World Survey of the development of Agriculture with special reference to West Africa.

(c) Role of Science and Technology in the development of Agriculture.

(d) Administration of agricultural production and the role of government

agricultural policy, research, extension education and services,

education and services, financial assistance to farmers, veterinary services and quarantine services.

### 3. Land Tenure System and the Principles of Land use for Agriculture, Forestry and Wild Life Conservation.

Factors affecting land use-topography, economic and social factors, population, situation of land for commercialisation, farm settlement schemes, development, management and conservation of forests and soils.

### 4. Fisheries

Distant sea, coastal and

Distant sea, coastal and inland water fishing, fish ponds curing, handling and distribution of fish. Marine products other than fish.

Note: Fish species to be mentioned Fishing equipment to be discussed.

### 5. Agricultural Engineering and Surveying

(a) Problems and prospects of mechanization of agriculture in West Africa.

(b) Tools, implements and machineries-uses, care and maintenance.

(c) Sources of power on the farm-wind, water, electricity, heat engines and animals.

Brief discussion on the working of the internal combustion engine.

(d) Farm surveying farm buildings and constructions (simply treated).

(e) Mechanization peasant agriculture.

## B. Soil Science

### 1. Genesis and Classification of Soil

(a) Rocks and minerals-their characteristics and simple classification.

(b) Weathering Processes

(i) Expansion and abrasion agents; water, wind and temperature.

(ii) Chemical Processes

Hydrolysis, hydration, oxidation, solution and reduction.

(iii) Biological Processes: Effects of organisms.

(c) Soil Formation

(i) Factors of soil formation-climate and vegetation, relief and drainage, parent material, living organisms, time.

(ii) Soil profile-soil horizon, soil profile defined: Genetic horizons of ideal profile specific to the area. Importance to Agriculture.

(d) (i) Principles of soil classification.

(ii) Kinds of soils in the local area and their existing classification.

### 2. Composition of the Soil

(a) (i) Physical composition of the soil: soil components, soil structure, soil texture, soil air, soil water and soil temperature.

(ii) Mineral composition of the soil: Quartz, feldspars, micas, clay minerals, montmorillonite etc.), colloids and colloidal systems, colloids defined, properties state of colloidal system sol, gel.

(iii) Organic components of soil-organic material, substance and matter: humus.

B. Effect of Soil composition on properties of the soil.

### 3. Soil Fertility

(a) Plant Nutrient Elements

(i) Classification Macro-N, P, K, Ca, Mg, S Micro-B, Cu, Zn, Mo, Co, Fe, Mn.

(ii) Factors leading to loss of these nutrients: Leaching, erosion, crop removal, etc.

(iii) Replenishment of lost nutrients: Soil organisms: Micro-Marco., effect of soil organisms on the soil. Nitrogen cycle; and carbon cycle; rock weathering, fertilizers.

(iv) Soil management as an attempt to strike a balance between loss and gains in soil nutrients.

### 4. Soil Conservation

(a) Types of irrigation and drainage.

(b) Soil erosion: Types, effects and control.

(c) Methods of soil conservation: terracing, contour farming, strip cropping, cover crops, mulching, etc.

(d) Water pollution and recovery (where it applied).

of diseases associated with the crops studied.

and colloidal systems, colloids defined, properties state of colloidal system sol, gel.

### C. CROP SCIENCE

Candidates should be familiar with agricultural and botanical methods of classification of crops

methods of classification of crops as well as the identification, morphology and reproduction of important crop plants.

#### 1. INTRODUCTION

Origin and geographical distribution of some important tropical crops including forage crops. Nomenclature and classification of crop

ture and classification of crop plants. Examples should be drawn from the major classes of locally cultivated crops.

#### 2. FACTORS AFFECTING CROP PRODUCTION

Ecological physiology of crop plants: the primary effects of light, radiation, temperature, water and inorganic elements on crop growth, development and yield.

#### 3. PRINCIPLES OF CROP PRODUCTION

Land preparation.

Methods of propagation: seed selection and testing, vegetative propagation. Nursery practises: time of planting and planting distances.

#### 4. PRINCIPLES OF PLANT BREEDING AND CROP IMPROVEMENT

- (a) Aims of crop improvement;
- (b) Basic genetic principles of crop improvement;
- (c) Methods of crop improvement:

Introduction and mass selection; hybridisation; multiplication; vegetative propagation.

#### 5. PRINCIPLES OF PLANT PROTECTION

- (a) Diseases of crop plants: Causal agents, symptoms, methods of transmission and eradication

#### (b) CROP PESTS

- (i) Classification of field and storage pests; extent of damages: e.g. insect pests, nematodes, rodents, birds and human beings.

- (ii) Principles of pest control: mechanical, biological, cultural and chemical.

#### (c) WEEDS AND THEIR CONTROL

- (i) Identification of common weeds and modes of dispersal; study of selected weeds with particular reference to locality.

- (ii) Control: mechanical, biological, cultural and chemical methods.

#### 6. STUDY OF SELECTED CROPS

Origin, geographical distribution; climatic and soil requirements: cultural practices, harvesting, processing marketing and storage of West African arable crops, cash crops and vegetative crops.

- (d) (i) Principles of soil classification.

- (ii) Kinds of soils in the local area and their existing classification.

#### 2. Composition of the Soil

- (a) (i) Physical composition of the soil: soil components, soil structure, soil texture, soil air, soil water and soil temperature.

- (ii) Mineral composition of the soil; Quartz, feldspars, micas, clay minerals, montmorillonite etc.), colloids

- (iii) Organic components of soil-organic material, substance and matter, humus.

- 1. Effect of Soil composition on properties of the soil.

#### 3. Soil Fertility

##### (a) Plant Nutrient Elements

- (i) Classification Macro-N,P,K,Ca, Mg,S Micro-B,Cu,Zn,Mn, Co,Fe,Mn.

- (ii) Factors leading to loss of these nutrients: Leaching, erosion, crop removal, etc.

- (iii) Replenishment of lost nutrients: Soil organisms: Micro-Marco-, effect of soil organisms on the soil. Nitrogen cycle, and carbon cycle; rock weathering, fertilizers.

- (iv) Soil management as an attempt to strike a balance between loss and gains in soil nutrients.

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- (a) Types of irrigation and drainage.

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#### 3. PRINCIPLES OF CROP PRODUCTION

Land preparation.

Methods of propagation: seed selection and testing, vegetative propagation. Nursery practises: time of planting and planting distances.

#### 4. PRINCIPLES OF PLANT BREEDING AND CROP IMPROVEMENT

- Aims of crop improvement;
- Basic genetic principles of crop improvement;
- Methods of crop improvement:  
Introduction and mass selection; hybridisation; multiplication; vegetative propagation.

#### 5. PRINCIPLES OF PLANT PROTECTION

- Diseases of crop plants: Causal agents, symptoms, methods of transmission and eradication of diseases associated with the crops studied.

### (b) CROP PESTS

- Classification of field and storage pests; extent of damages: e.g. insect pests, nematodes, rodents, birds and human beings.

- Principles of pest control: mechanical, biological, cultural and chemical.

### (c) WEEDS AND THEIR CONTROL

- Identification of common weeds and modes of dispersal; study of selected weeds with particular reference to locality.
- Control: mechanical biological, cultural and chemical methods.

### 6. STUDY OF SELECTED CROPS

Origin, geographical distribution; climatic and soil requirements: cultural practices, harvesting, processing marketing and storage of West African arable crops, cash crops and vegetative crops.

The study should include at least one cereal from group 1, one legume from group 2, and four plants chosen from at least three of groups 3,4,5 and 6 below:-

#### GROUP 1

#### CEREALS

Maize-Zea mays.

Millets-Pennisetum typhoides, Setaria italica, Eleusine corocana

Rice-Cryza sativa

Guinea Corn-Sorghum bicolor (S. vulgare)

Wheat-Triticum vulgare

Tamba

Acha

#### GROUP II

Beans-Phaseolus spp

Cow peas-Vigna unguiculata

Groundnut-Arachis hypogea

Soya Beans-Gycine soja

Bambara groundnut-Voandzeia geocarpa (V.Subterranea)

Yam bean-Sphenostylis steno-carpa

Pigeon pea-Cajanus cajan

#### GROUP III

Cassava-Manihot esculenta

Yams-Dioscorea Spp

Cocoyams-Araceae (Colocasia or Xanthosoma)

Potatoes (European P. Solanum tuberosum (Hausa P.)-Plectranthus esculentus

Sweet Potatoes-Ipomoea batatas

Onions-Allium cepa

Shallot-Allium ascalonicum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicon esculentum

Pumpkins-Cucurbita maxima

Tomatoes-Lycopersicon esculentum

Carrots-Daucus carota

Cabbage-Brassica oleracea

Cauliflower-Brassica oleracea, var. botrytis.

Garden egg-Solanum melogena

#### GROUP IV

Avocado pear-Persa gratissima

Bananas-Musa Spp

Citrus-Citrus Spp.

Guava-Psidium guajava

Mango-Mangifera indica

Pawpaw-Carica Papaya

Pine-apple-Ananas sativus

Cashew-Anacardium occidentale

Water melon-Colocynthis citullus

#### GROUP V

Cocoa-Theobroma cacao

Coffee-Coffea Spp.

Colanut-Cola Spp.

Benniseed-Same as Sesame

Ginger-Zingiber officinale

Sugar cane-Saccharum officinarum

Peppers-Piper nigrum\*

## GROUP VI

Coconut-Cocos nucifera  
Oil Palm -Elaeis guineense  
Cotton-Gossypium Spp  
Shea-butter-Butyrospermum park ii  
Sunflower-Helianthus annuus  
Sesame-Sesamum orientale  
Rubber-Hevea brasibensis  
Sisal hemp.-Agave Spp.  
Ka,ok-Ceiba pentandra  
Kenaf.  
Urena lobata.

### 7. PASTURES AND FORAGE

Pasture agronomy, grasses, legumes, their distribution, improvement, quality and assessment, establishment and conservation.

### D. ANIMAL SCIENCE

#### 1. Introduction

Role of livestock and livestock products in West African countries.

#### 2. FARM ANIMALS

Types and classification of locally available breeds of cattle, sheep, goats, swine, poultry.

#### 3. ANATOMY AND PHYSIOLOGY

(a) Brief gross anatomy of named domestic animals: cattle, goats, horses, pigs, sheep, rabbits, poultry and fish.

(b) Physiology of digestion, reproduction, lactation, milk let down, egg formation and laying, circulatory, and endocrine systems.

(c) Environmental physiology: The direct and indirect effects of climate (tropical) on farm animals with due regard to their effects on grazing habits, growth, reproduction, milk production, egg production, gross yield and quality of food supply.

#### ANIMAL NUTRITION

(a) The main nutrients—carbohydrates, proteins, fats, minerals, vitamins, water—their chemical composition and their role in animal nutrition. Malnutrition in farm animals.

(b) Feeds and feeding-methods of preparation of foodstuffs for farm animals—cooking, cutting, grinding, pelleting etc.

*Note: Emphasis should be laid upon the reason for feeding these forms of feeds to the different types of animals.*

(c) Principles of ration formulation—balanced maintenance, production, starter rations.

*Note: Mathematical and technical details of ration formulation will not be required.*

### 5. ANIMAL HEALTH

#### (a) DISEASE

Causes and prevention; pest and parasite control; insects and ticks as carriers of diseases in farm animals. Life history of one endoparasite of farm animal (e.g. liverfluke, roundworm, tape worm, trypanosomes); and one ectoparasite (e.g. ticks and lice).

(b) Diseases as the limiting factor in the development of animal husbandry in West Africa. Detailed study of the more common diseases of local farm animals, preventive and control measures, in respect at least one of each type of

- (i) Virus-fowl pox, foot and mouth diseases, rinderpest.
- (ii) Bacteria-Anthrax, tuberculosis, contagious abortion.
- (iii) Fungi-Scabbies, ringworm.
- (iv) Protozoa-trypanosomiasis, coccidiosis.
- (v) Metabolic-milk fever, ketosis, rickets, bloat etc.
- (vi) Mycoplasmatles-pleuro-pneumonia.

### 6. MANAGEMENT OF FARM ANIMALS

Detailed study of management aspects of the following farm animals from birth to maturity:  
Monogastric e.g. pigs, poultry  
Ruminant e.g. sheep, goat, cattle.  
Herbivore e.g. rabbits, guinea-pigs.

A field study of at least one animal from each class is essential.

### 7. BREEDING AND IMPROVEMENT OF FARM ANIMALS

- (a) Aims.
- (b) Principles of genetics in respect of animal breeding.
- (c) Methods: Selection, inbreeding, crossbreeding and effects. Artificial insemination. Castration.

### E. AGRICULTURAL ECONOMICS

1. Factors of production—land, labour, capital, entrepreneurship.
2. Law of diminishing returns.
3. Principles of demand and supply.
4. Marketing of agricultural products.
  - (i) Operations—Processing and storage, packaging, transportation and distribution.
  - (ii) The role of the producer, middlemen and the consumer; individuals, co-operatives, corporations, firms, Marketing Boards.
  - (iii) International Trade with respect to agricultural produce.

5. Agricultural Financing—sources and nature of farm credit and financing.

6. Farm Record  
Farm diary, input records, production records, farm inventory, farm log-book.

#### 7. Simple Accounting

Preparation of entries of sale and purchases, profit and loss accounts.

### PRACTICAL EXAMINATION

During the course the candidate is expected to have carried out and participated in practical work on livestock management, farm and vegetable gardening practices. Candidates should also be exposed to the major products of the forest type in their locality.

#### CLASSIFIED ADVERT

#### POULTRY

For the Construction of Wooden Battery Cages or Fixing of Metal Batteries, consult experienced Carpenter M. Jimoh, 10 Adeniyi St., (Behind Old Iitre's Palace), Iitre, Lagos

It is essential that candidates go on field trips to farms in different ecological areas and game reserves within the country.

The Practical Examination will test comprehension, skill observation and recognition.

## SYLLABUS

### A. GENERAL AGRICULTURE

Identification, uses, and maintenance of common farm tools, implements and simple farm machines.

### B. SOIL SCIENCE

1. Identification of common rock types (igneous, metamorphic and sedimentary).
2. Soil profiles from practical field work.
3. Laboratory work on physical properties of soil:

- (a) Mechanical analysis using the hydrometer method and sieves.
- (b) Determination of particle density and total pore space.
- (c) Determination of moisture content of a moist soil sample.
- (d) Determination of maximum water holding capacity.
- (e) Determination of wilting point to be demonstrated.

4. Laboratory work on chemical properties of soil:

- (a) Demonstration of use
- (a) Demonstration of use of pH meter.
- (b) Demonstration of active and reserve acidity using the pH meter, and colorimetrically, using a comparator.
- (c) Evidence of cation exchange by displacement of cations with potassium and precipitation of the displaced calcium with ammonium oxalate.

### C. CROP SCIENCE

1. Identification of seeds, seedlings, fruits, storage organs and other essential parts of the more common crop plants, local weeds, pasture grasses and legumes.

2. Identification of casual organisms (where possible), nature or damage, prevention and control methods for the common crop pests and diseases.

3. A working knowledge of principles of disease and insect and plant predation, identification, testing of the most common insecticides and fungicides, and demonstration of their

proper use, and identification of the most common local crop plants in the country.

4. Candidates may be asked to the following matters:

Preparation of seed beds, fertiliser applications, manuring, weeding, use of spraying materials, vegetable propagation, germination testing.

### D. ANIMAL SCIENCE

1. Identification of the most useful breeds of animal types available in the student's locality. Methods of restraint, handling, and grading farm animals.
2. Identification of the major internal organs of farm animals (no microscopic studies), e.g. organs of the digestive systems, liver and kidney.
3. Identification of the common ectoparasites (e.g. ticks and lice), and endoparasites (e.g. live-fluke, tape worm) of the farm and fish.
4. Recognition of the features of all stages of the life-cycle of pests and diseased condition in animals.
5. Recognition and uses of major animal feeds and feedings stuffs and their local sources.
6. Simple methods of hygienic control, drugging, clipping, spraying and simple medication methods for farm animals.
7. Ability to select
  - (i) Animals and poultry for breeding;
  - (ii) Eggs for hatching and to separate good and poor layers, sick and healthy animals.

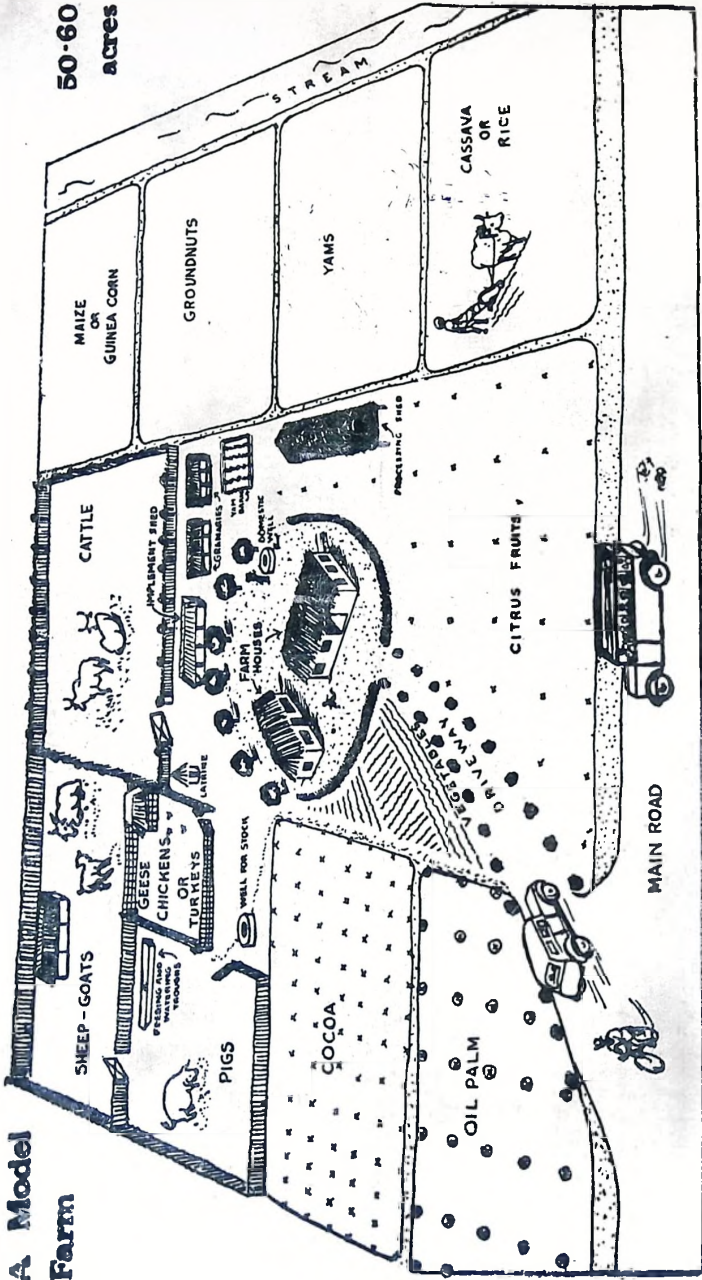
### E. PROJECT WORK

1. A Farm Project is to be carried out by each student OR a group of not more than four (4) students and a report submitted on it individually during the second term of the year of examination.

2. Field Note Books, Farm Records and Account books related to the Project work the candidate has chosen.

**A. Model Farm**

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Abiodun Ojugbele.

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AGRICULTURAL  
SCENE

# OFN: nationwide

Since the Head of State—Lt. Gen. Olusegun Obasanjo—launched the Operation Feed the Nation, much response has been noticed all over the Federation. Hardly any other programme has had so much true support. The reason is not far-fetched. One is that Agriculture had always been a lowly pursuit scoffed at by the educated, despised by the indolent and avoided by the jobless even though everybody eats daily. But because the Head of State could put aside his national cares temporarily though and apply his brawn to till, many mimics with a view to playing to the gallery have made sure their show were publicised as widely as possible. Report shows that everywhere people are applying themselves to the task. The programme is spreading like wild-fire.

Leading the campaign was a joint effort by the Nigerian Airways and Caledonian Airlines which to mark their joint inaugural flight gave the National Committee on OFN one thousand five hundred chicks. This paper concedes good judgment and planning to the National Committee but would like to suggest that the birds should not be sent to a Government poultry farm. Rather they should be divided free among very small but well-managed poultry farmers.

To reach such people, agricultural extension workers have to be consulted. Such a plan would yield good returns as opposed to lumping the poor chicks into a Government farm where disinterestedness on the part of the workers on the one hand and official red-tape militating against quick and timely decisions by the officials on the other hand will cause the young chicks to die en masse within a short time.

Not unconnected with the OFN the Agricultural Credit Bank has disclosed its plan to open an area office in Enugu, Anambra State. The idea is to bring financial facilities near the farmers in that sector of the nation. More of such offices at nodal towns and state capitals will justify the claims of the Agric Credit Bank to spread agricultural credit evenly all over the country.

Plans are also on to breach the havoc caused crops by pests. The State Government of Ogun, Ondo and Osun have jointly earmarked ₦3m for spraying insecticides to combat cocoa pests. Also in Kaduna state a pest protection unit has been set up.

Mention must be made of the liberal compensation by the Federal Military Government to Student Participants of the OFN, each student receives ₦96; where private farmers are involved they pay only ₦20, the balance will be added by the state Government.

In effect, the country is poised for a big agricultural reawakening which we pray may be sustained to keep hunger and dearth of food off our doors once and for all.

Not everyone will ever get a personal car or house, but everyone has to be fed. It is the appreciation of this fact by the Federal Military Government that started the OFN which has endeared the FMG to many Nigerians and homes.

## New Prices for Fertilizer Out

New prices for all types of fertilizers have been fixed in Kaduna State, recently.

Announcing this at a press conference in Kaduna, the state's Commissioner for Economic Planning and Rural Development, Malam Altime Liman Mohammed said this was in line with the Federal Military

Government's decision to pay up 75% subsidy to all state governments on the purchase of fertilizers.

The prices which are meant to assist the farmers in their participation of the Operation Feed the Nation are as follows:-

Single Superphosphate, ₦3 per bag; S.S.P. (Baronate) ₦3 per bag; Calcium Ammonia Nitrate ₦3 per bag; Sulphate of Ammonia, ₦3.75 per bag; Urea, ₦4.75 per bag; NPK (20-20-0) ₦4.75 per bag; NPK (14-28-14), ₦4.75 per bag and N.P.K. (20-20-0) Baronated, ₦4.75 per bag.

Members of the public have been urged to report to the

nearest authorities if they were asked to pay more than the approved prices.

This is necessary in view of the recent report of Commission of enquiry set up by the present administration to probe the ways and manners that the previous distribution were effected.

From a section of the report, it was disclosed that instead of

the fertilizers being distributed among the farmers for their use, some officials in the states' ministries saw the exercise as an opportunity to enrich themselves.

The lessons gathered from this were that the new administration in the states must not neglect the welfare of the farmers.

And now that the rain season is here with us and operation-feed-the-nation spreads along, the focus should be on agriculture to plant today for tomorrow's harvest.

### AGRIC NEWS BRIEFS

#### OGUN STATE

An ultra-modern abattoir is to be built in Abeokuta. Five slabs are also to be constructed during the current financial year. To this end, the state government is to receive a grant of about ₦2 million from the Federal Military Government. This was made known by the states commissioner for Agriculture and Natural Resources, Mr. M. Ola Buraimoh.

#### KADUNA STATE

At the opening of a two day meeting of the Northern state's Pest Control Review Committee, the states Commissioner for Agriculture, Malam Aliyu Bala Kuki, disclosed that more than one third of grains crops harvested in the country are destroyed yearly by pest.

He also disclosed that the United Nations Food and Agriculture Organisation (F.A.O.) has estimated that foodstuffs destroyed by pests in Africa alone were sufficient to feed 55 million people yearly.

#### OYO STATE

Contributing his progressive quote to the "Operation Feed the Nation," the Orangun-Ila in Oyo state has called on farmers to increase their food production ten-fold.

About ₦327,000 have been approved as loan to boost small scale industries and food production. Out of the amount, about ₦76,000 has been voted for financing a food processing pro-

#### FISHERIES TRAINING IN BRITAIN

Ten senior Nigerian fisheries officers representing both Federal and State fisheries have begun a three-week examination and assessment of the training facilities provided by British establishments in the whole field of fisheries.

The tour, organised by the UK's White Fish Authority, will take them to the fishing ports of Hull and Grimsby, and up to Mallaig and Ardtoe on the west coast of Scotland. The party will also be visiting research centres and fish farms.

At the end of the tour they will be chief guests at a special reception given by the Deputy Lord Mayor of Hull in the city's Guildhall.

The tour will end on September 3 with a visit to London and the Tropical Products Institute, the scientific unit of Britain's Ministry of Overseas Development which advises developing countries on the handling, processing, storage, transport and marketing of a wide variety of tropical products.

Nigerians on the tour are: Mr. E.O.E. Odiogun, Chief fisheries officer, Ministry of forestry, Fisheries and Water Resources, Calabar.



#### NIGERIAN EXECUTIVES SEE TRACTOR PRODUCTION

Mr. A.B. Ajomale, the Acting Assistant General Manager of the Great Nigerian Insurance Company in Lagos, tries his hand at the wheel of a tractor produced by one of Britain's leading manufacturers of agricultural machinery. Together with seven other top Nigerian businessmen, he recently visited the English midlands factory of Massey-Ferguson at Coventry, during a six-week intensive management development course in neighbouring Birmingham.

The courses run by G & B Management Development Ltd. have been developed specially to meet particular needs. The Nigerians represent the vanguard of many more overseas middle and senior management men will be attending courses in Britain. The programme includes lectures from many experts in the field, as well as visits to major manufacturing organisations.

The other Nigerians taking part in the course are left to right: Mr. Sola Awojobi, General Manager and Director of Nidoco Ltd., of Lagos; Mr. James Afolabi, Managing Director of Alumaco of Nigeria Ltd., of Lagos; Mr. Joe Arausi, Managing Director of A.G. Christie (Nig.) Ltd., of Benin City; Mr. S.A. Akinjobi, Managing Director of Jolliters Chemists (Nig.) Ltd., of Lagos; Mr. Olu Agbesanwa, Import Administrative Manager of Adebowale Electrical Industries Ltd, of Lagos; Mr. Ayoola Ogunlana, Manager of Research and Development, Wema Bank Ltd. Lagos and Mr. Hassan Akande, Production Manager of C.F.C. Furniture Co. (W.A.) Ltd., of Mushin.

Continue overleaf

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## OPINION

### AGRICULTURE IN SCHOOLS

Most schools founded on grammar basis have become too difficult for adaptation. More often than not the head was groomed to teach arts which were the vogue and criteria for civilization at one time. Such a head usually plons on any attempt to mark out plots for school farms.

Some parents too are too high-browish to think of farming. Such feel that the education they will give their children will stand them well enough to buy food at any price. As a result such children grow with a snub for farming and the farmer.

No wonder some students of the OFN ran away from their beats. University graduates while they will not run away practice lots of indolence to shack chores in farming.

It is needless to say that the search for money blindfolds these people—parents and teachers—but students' early life has to be corrected. While parents may be allowed to handle their children as they like, their training is the State's concern; as such, the best of every form of training should be given. Over the years some will gravitate to one form of endeavour or another but each will have a faint idea of and appreciate what the other chap is doing (say) farming.

It is time therefore that Agriculture forms a compulsory subject for the first three years at School before the choice of subjects for the School Certificate. Such an exposure will definitely prepare many a youth against later life. Besides, student who offer Agriculture in the Exams need encouragement.

### PROCESSING PLANT

Perhaps the greatest head-ache a poultry breeder has is disposal. Often-times a contract fails or festival sales flop as a result of an untimely catastrophe thereby causing poor sales. In effect birds are left uncleared.

Marketing also entails forward planning. As such, evisceration, deep freeze storage and packing become necessary.

A processing plant entails a lot of capital which most farmers cannot afford. To keep them in business is to arrange how to absorb all poult at marketing age by a Central Processing Plant which will process and store chickens for marketing.

Maintenance which is an important overhead in Processing Plants is also a big problem the small farmer should not be saddled with just as he is not bothered about flying in his day old chicks, but pays a small amount for those whose main job is airfreighting.

### BANKS AND COLLATERALS

Of late our banks have become unduly touchy when it comes to giving loans to farmers. While an LPO or a Contract Agreement presented by a trader or builder satisfies the banker to push out a loan, he (the banker) usually asks for property and other assurances from the farmer before helping the latter with a loan however little.

Admittedly farming suffers from a lot of vagaries—weather, sales, mortality or poor harvest—which affect agricultural economy; it is wrong to feel that these hazards are always with the farmer.

In many callings, a small outlay suffices to set up a good business but not in agriculture. This is why graduates in Agriculture usually seek employment rather than set up private farms.

Nevertheless, the Banks have to ensure the return of their loans. A way out is to study impartially a farmer's proposal and help him towards the fulfilment of that objective not only by lending out the much-needed money but also by supervision and whenever possible to supply on charge inputs—equipment, seeds, fertilizers, day-old chicks etc.

Continued from P 5

## NEWS

ject in Ibadan. Interested Industrialist have been called upon to apply for the loan.

### ONDO STATE

The State Government has voted ₦50,000 to the "Operation Feed the Nation." The state's commissioner for Agriculture and Natural Resources, Mr. Sola Fapohunda disclosed this when addressing volunteers during his tour of the project sites in Akure.

He further said that the amount would be used to purchase among other things cutlasses and hoes. A secretariat would be built and horticultural centres would also be established.

He further announced that 2260 tonnes of assorted types of fertilizers were on sale at highly reduced prices while 36 kilogrammes of various vegetables were also on sale throughout the state to farmers.

### CROSS RIVER STATE

The Cross River State farmers' Association's general secretary, Mr. O.U. Ekpo has called for the formation of a national association of farmers. This he said, would enable farmers to speak with one voice to the Federal Government on how best to improve farming.

### ANAMBRA STATE

A new rice herbicide which is used worldwide, "STAM F. 34T," was launched at Abakiliki by the National Oil and Chemical Company.

Speaking on the occasion, the agrochemical manager east for the company, Mr. M.C. Onuoha said the application of the herbicide in any rice field saves the problem of weeding.

The chemical which has no effect on the soil or the rice, kills all the weeds and allows the rice to grow to harvest period.

Replying, the Abakiliki based distributor of the National Chemicals Limited urged farmers to use Vetox 85 which is specially made for rice nurseries to go along with the "STAM F. 34T" chemical.

Later the chemical was sprayed at Mr. Ibeh's rice farm and it proved effective.

Continue on P 7

## LAGOS STATE

A Nigerian Institute of Food Science and Technology (NIFST) comprising of food scientists and technologists in Nigeria has been established.

At an inaugural meeting held recently, over 50 members of the Federal Institute of Industrial Research, Oshodi (FIIRO) endorsed its objectives.

Among its objectives to disseminate knowledge amongst food technologists by sponsoring symposia, seminars, studies and organising other programmes highlighting solutions to food problems.

Officials appointed to govern the Institute include Dr. I.A. Akinrele, Director of FIIRO (President); Nigerian Breweries Mr. A. Ferdinandus (Vice President); Dr. P.O. Ngoddys, a senior lecturer, Department of Food Science and Technology at the University of Ife (honorary secretary).

The officer in charge of the National Accelerated food producing project of the state's Ministry of Agriculture and Natural Resources Mr. J.A. Ajayi announced in Epe Division that some varieties of grains such as maize and rice would be experimented upon. This he said would help farmers of the state not only to have quality yields but also to increase their productivity.

## KANO STATE

The acting governor of the state, Group Captain W.I. Aleyidino has warned student volunteers of the OFN against loafing about.

He made this warning when he made surprised visit to a farm centre to assess their progress. He said the volunteers should not regard the OFN as "a kind of jamboree for relaxation."

## KWARA STATE

The Military Governor Brigadier George Innih has donated a piece of land in Agenebode to the 145 Infantry Battalion of the Nigerian Army.

It was announced by the Four Infantry Brigade Commander in Agenebode Lt. Col. L.P. Nyam when he launched the scheme there.

Speaking later to the press, the Second-in-Command of late 145 Battalion, Lt. L.G. Pabor said his men have already planted maize, rice, onions, groundnuts and potatoes.

Continue on p. 26



## NIGERIAN VET STUDIES IN BRITAIN

Nigerian veterinary officer, Dr. John Bincan, carries out a calcium study of laying poultry serum at the School of Tropical Veterinary Medicine in Edinburgh, Scotland, using a spectrophotometer. Dr. Bincan, a divisional veterinary officer in the Jos division of Plateau State, is currently taking a diploma course at the school in animal health and production.

The course, run jointly by the school and the Department of Agriculture of the University of Edinburgh, lasts for nine months. On completing it, Dr. Bincan plans to tackle a research project directly related to his field work at home, which will lead to an M.Sc degree.

## LETTERS

### FARMERS WILL STAY IN FARMS IF...

Awka Division in East Central State is the main source of food supply for Aba and Port Harcourt townships. But the division is hardly remembered in the distribution of amenities.

The power station at Afam in the division is the source of electricity supply to Aba, Port Harcourt etc., yet no town in the entire area has electricity supply. The Government should encourage the farmers by providing them with good roads, electricity and pipe-borne water.

ABA. Monday Eket,

#### FARMSTOCK, REGULARLY PLEASE

I wish to be regular subscriber of your magazine, 'FARMSTOCK.'

The last copy I have was published in July 1971. I shall be grateful if you can send me all the copies till date as well as subsequent ones.

Please let me know what to pay and qualify as a regular subscriber.

Thanks for your co-operation. Yours faithfully,

Mrs. Bernadette O. Awah.

Itohan Grammar School, P. O. Box 81, Benin City.

#### Editor's Note:

Thanks indeed for your encouraging letter. A despatch of some old copies has been made to you. Annual subscription for FARMSTOCK is ₦4.20 please.

#### IS IT STILL ON?

I would like to know from you if your FARMSTOCK

(FARMERS monthly magazine) is still in circulation and if it is how much will it cost to post one copy to me monthly.

Thanks

Yours faithfully,  
D.O. Osotayo.

62 Ojowo Road, Ijebu-Igbo, Ogun State.

#### Editor's Note

Farmstock is still circulating; annual subscription is ₦4.20 please.

#### POWER SETBACK

The supply of electricity of Minna Town in the Niger State has never been good for months This is hindering the industrial and agricultural development of the town.

The state's government should do something to improve the supply of electricity so as to combat some of the problems encountered in respect of water supply in small scale industries.

G.H. Zuru, KADUNA.

#### WATER

#### WATER!! PLEASE

I wish to appeal to the Niger State Government over the water shortage in Bida. Also the frequency of power failures is no less sickening. I hope that the State's government will do something to alleviate the sufferings of Bida inhabitants.

The government should know that "Water" is very necessary for agriculture in general.

Alhaji Mutani Bida,

KANO.

## ESSENTIAL FACTORS IN POULTRY

# Water!

Not a few think that all that is necessary in poultry is to house the birds either on deep litter (a fenced enclosure) or battery cages, give feed and begin to collect profits from investment involved. No one will say such is impossible but there are a number of conditions to be fulfilled prior to expecting any profit.

*Commercial poultry breeding demands taking good care of*

*the birds unlike when the birds have to come about fending and helping themselves. After selecting a good breed, usually*

*from a reputable hatchery, one has to ensure good housing which will be discussed later and feed them well too.*

It is on this aspect of feed that this article is directed. To be able to control every action of the birds restricting their movement is necessary. Let us now agree that our birds are protected. The next most important need of the birds is WATER.

In intensive units, restricted birds should be given all their requirements. Water is very important for easy digestion. Many poultry farmers complain about the poor performances of their birds without ensuring adequate supply of clean water.

It is highly beneficial to recognise the need for water, which is about three quarters of the constituents of an egg or broiler by weight. With the exception of fresh air, water is the cheapest raw material required for the production of eggs or chicken meat. Because we operate in this country through two extremes of plenty (during the rainy season) and scarcity (during the dry season), we tend to take water for granted—a steady supply of good water.

In less fortunate parts of the world, water is treasured and conserved. Even in this country, with the demands of an expanding population and industry, we shall have to reconsider our wasteful ways, plus, of course, the fact that the demand for water like other items of life, has risen, hence its cost. In many parts of the country now, water-meter is used, in order to reduce overheads therefore, poultry farmers have to use water economi-

cally.

A few facts and statistics quickly underline the significance of water to the poultry producer. WATER accounts for 70 per cent of a newly laid egg, and nearly 60 per cent of the body weight of an adult hen or broiler at killing age. After 8 hours without water, egg production is seriously affected and nephritis can be induced. After 24 hours without water at a temperature of 80°F, the birds will start dying.

### Lack of Water: Effects

Inadequate water consumption, caused by faulty supply or insufficient drinking points, depresses production and growth rate, and on many farms, it is an unsuspected cause of poor performance. Water consumption should be observed and recorded as carefully as food consumption whenever possible. A sudden drop is often indicative of the approach of a health crisis.

Inadequate or badly distributed drinking points may trigger off latent infections. The critical period is often during a heatwave. Being unable to loose heat by perspiration because the body is covered with feathers, poultry depends largely on drinking water to keep down body temperature, and the birds soon become prostrate if they are deprived during hot weather.

A poultry farmer must be aware of the golden rule that adequate clean water supply should be made available to poultry at all times, but he may fail in his duty to recognise the right quantity to be given at different stages of growth.

Water requirements can be



### THE POULTRY INDUSTRY

The photo was taken at a new broiler farm in the Kaisiadoris strict of Lithuania. This is the usual picture of a chicken use: its inhabitants are having their dinner. The only thing usual about it is that there are no people distributing the feed. They have been replaced by machines. All the production processes at the farm have been mechanized or automated. Last year, the farm produced its first 400 tons of chicken at. After its second and third production lines are committed, it will be one of the biggest in the republic. It will duce annually for the market 5,500 tons of meat and 8.8 lion eggs.

Photo by M. Baranauskas (APN).

calculated, but this is frequently very different from actual usage because layers may drink or waste water through excessive drinking or boredom resulting in flicking or splashing. It is important to take this into consideration during the calculation of water requirement because such wastage can easily add up to a higher percentage over the Bird's needs.

The following facts and figures may be a useful guide in planning for poultry water requirement.

#### AT BROODING

##### Water Consumption

AGE	100 chicks/day.
0-2 weeks	1-5 litres
2-4 weeks	5-7½ litres

Practical application from day old to 4 weeks:-

- 1) One drinking fount/80 chicks
- 2) One circular automatic drinker/50 chicks.
- 3) 1.27-2.54cm of continuous supply.
- \*4) One nipple troughing/chick drinker/lb chicks.

5) Or a combination of any of the above.

\*Where nipple drinking system is used in Cages.

#### AT REARING

##### Water Consumption

Ages in Weeks	Consumption/100 chicks/day in litres
4-6	9.1
6-8	11.4
8-10	13.6
10-12	15.9
12-14	18.2
14-16	20.5
16-18	21.6

Water supply is one of the key factors in choosing a poultry farm site. The criterion should be the ultimate, not the immediate requirement. Many development plans have been devastated by inadequate reserves.

Water is essential for the cleaning of poultry equipment, being the only effective means of loosening hardened droppings. Subsequently, it serves as a medium whereby disinfectants can be applied to buildings

and equipment in solution. Water is a vehicle of waste. This could be mostly on premises where a poultry is undertaken. It carries blood, feathers, poultry manure and other wastes as effluent into sewage works. It is also employed as a medium through which harmful organisms and other dirt in poultry houses are washed away.

Waste water from the laying hens is released firstly from the lungs as part of the respiratory process, and secondly in faeces. It is normal for faecal matter to have a water content of about 70 per cent. Thus if 1,000 layers produce 1 ton of manure per week, this will include about 1,500 lbs water.

Water has many poultry functions:

- a) it softens feed,
- b) aids digestion and absorption of food.

It is essential for internal lubrication and elimination of waste products. Its role in egg production and egg size cannot be over-emphasized, representing as it does so much of the egg content itself.

#### NEGLIGIBLE COST

Good water costs money, but when one is faced with its problems that may cause economic loss to a poultry enterprise, one will not mind spending more money in that direction. Consumption per laying bird of all purposes at ₦1 per 100 litres, averages under 1k per bird on a medium sized farm. Even if there were no social objections to wasting water, good economic reasons should encourage poultry farmers to avoid unnecessary wastage.

In a very intensive unit water problems could really be very bad experience indeed. Since the side effects could principally be loss of production and high mortality rate. The problems of negotiation, carting, distribution and the practical application to the birds are strong enough to induce headache, stomach trouble.

*Continue on P 25*

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# POULTRY FARMING : FACTORS

## FOR SUCCESS

It is the poultryman's wish to make poultry 'pay.' To do so, is to ensure that the enterprise yields a satisfactory net profit commensurate with the capital invested, the labour used and the risks taken. Poultry can definitely provide this profit, either as a full-time job or a profitable part-time hobby, but only so long as the man:-

1. Has a 'love for livestock'—an inherent stock sense.
2. Is willing to work hard and to be certain that jobs are done before delay has resulted in the birds being adversely affected.
3. Has the basic technical practical knowledge.
4. Adopts sound business principles and manages efficiently.
5. Does not experiment (or only with great—caution—).
6. Has sufficient capital, and apportions it correctly.
7. Starts right.

In return, one will enjoy a satisfactory income, establish a pleasant gainful and health-giving work, enjoy the thrill of tasks successfully accomplished, be master of his own destiny and provide an established business for one's children.

Let us be frank. Failure will follow if one:—

1. Takes no interest in the stock
2. Is lazy and too fond of leaving the work to others.
3. Has no experience at the commencement.
4. Is slack in buying and selling and in keeping books and records.
5. Wastes time and money trying unproved schemes.
6. Is under-capitalized.
7. Starts wrong.

### HYGIENE, SANITATION AND DISEASES

#### RECOGNITION OF SYMPTOMS

It is of vital importance that the poultryman should have some knowledge of the diseases that he may possibly run up against in the course of his work. He must also know that steps to take to counter an outbreak, pending the arrival of professional help. Above all he should be thoroughly conversant with all the preventive measures necessary to keep diseases at bay.

#### HYGIENE AND SANITATION

Disease control can only be achieved with a sound knowledge of husbandry and hygiene. The correct spacing of birds, adequate ventilation, the prompt recognition and isolation of ailing birds, general sanitation of housing and equipment are just as important as knowledge of modern drugs. Sub-normal health resulting from parasitism, faulty nutrition and chronic infections, interferes with production potential and takes an even greater toll of profits than actual diseases.

#### DISEASE RESISTANCE

Let this be well understood: There are germs, parasites fungi and viruses in the air, buildings soil and those carried by other poultry animals, merely waiting their opportunity to attack. I am convinced that the best way to prevent disease is to breed, house, feed and manage in such a manner that the disease 'bugs' (most of them) just cannot make their presence felt. Disease can be successfully combated by:—

1. Selecting the breeders for stamina and health first; and heavy egg production second.
2. Breeding from birds which have no inheritable diseases (such as bacillary white diarrhoea).

3. Breeding from which have no predis position to disease (such as fowl paralysis).
4. Keeping the defensive system of the fowls' bodies in a high condition of perfection.
5. Feeding a complete ration in an approved manner.
6. Housing efficiently, particularly with regard to over-crowding.
7. Providing clean, well-drained ground at all times (grass, where provided, must be kept short).
8. Paying strict attention to sanitation and cleanliness.
9. Using disinfective where necessary.
10. Immunization by vaccination.
11. Exterminating rats and mice.
12. Destroying external parasites (flea, lice and mites) and internal parasites such as worm.

So there is no one secret operation to prevent disease. It is a matter of preserving good health daily.

### GAMBO ADAMS

Headquarters  
1, Armoured Regiment  
Nigerian Army ARMD Corps  
P. O. Box 759  
KADUNA. Tel: 23301 Ext. 3.

*Continued from p. 5*

### FISHERIES

Mr. O. Elliott, Chief Fisheries officer, Ministry of Agriculture and Natural Resources, Ibadan.

Mr. Z.A. Adesanya, Chief Fisheries officer, Ministry of Agriculture and Natural Resources, Abeokuta.

Mr. E.N. Eziuzo, Principal Fisheries Officer, Ministry of Agricultural and Natural Resources, Enugu.

Mr. O. Bakare, Principal Fisheries Officer, Ministry of Agriculture and Natural Resources, Ikeja.

Mr. M.A. Obakin, Principal Research Officer, Nigerian Institute for Oceanography and Marine Research, Lagos.

Mr. C.C. Emehelu, Principal Fisheries Officer, Ministry of Agriculture and Natural Resources, Owerri.

Mr. A.A. Aderonmu, Senior Fisheries Officer, Federal Department of Fisheries, Lagos.

Mr. M.P. Hyang, Senior Fisheries Superintendent, Ministry of Agriculture and Natural Resources, Jos and Malam Bawale Kankia Higher Fisheries Superintendent, Ministry of Agriculture, Kaduna.

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## AGRIC NOTES

### WEEDING CASSAVA

#### CROPS WITH PARAQUAT

Paraquat can be used to control weeds in cassava cultivation, provided the timing is right.

Weeds are a major problem in cassava growing and control is necessary if crops are to be good. It is particularly important that weeding should be done in the early stages.

Handweeding is carried out in Thailand at 45 days, 3-4 months and 5-6 months after planting. In Malaysia handweeding intervals are 25-30 days, 45-60 days and chemical weed control six months after planting.

Now work done by Mr. R.S. Harper of Plant Protection Ltd of Britain, in Thailand has shown that paraquat—a bihybrid herbicide developed by the company and now in worldwide use—can be used from three months onwards.

#### Not Too Early

Because paraquat is deactivated by the soil, it is not taken up by root crops such as cassava. But it must not be used at too early a stage, because green photosynthetic tissue then exist at the base of the stems and paraquat coming into contact with this tissue will be absorbed, leading subsequently to the death of the plant.

By the end of three months growth this green tissue has lignified to a brown bark which will not take up paraquat. It is at this stage that, Mr. Harper found, paraquat can be used without damaging the cassava. In view of the value of cassava as an explorable source of starch, anything that will reduce the cost of production is of practical value to the grower.

Application of paraquat can be made at the rate of 0.2-0.4 kg/ha at three months and then

repeated 10-14 days later. One further spray before harvesting was found desirable. The paraquat used was Gramoxone containing 200 g/l active ingredient.

Mr. Harper's work is reported on in detail in PANS, a journal on pest control published by the Centre for Overseas Pest Research, College House, Wrights lane, London W8.

Plant Protection Ltd, Fernhurst Haslemere, Surrey, England.

it is thought, enables the land to be used more economically.

It also has the effect of keeping the soil covered between the slower-growing rows of the main crop, which is good where soils are liable to erosion by rain and wind.

However, there must be some competition for nutrients in the soil and even light as the two rows of plant grow and it is usually assumed that there is a slight decrease in yield from

### Higher Yields

Mr. D.J. Andrews, of the Plant Breeding Institute, Cambridge, eastern England, has shown while working at the Institute for Agricultural Research, Samaru, Nigeria, that intercropping of sorghum with early cereals such as millet results in not only higher total yields of the two crops but also in higher yields of the sorghum than if grown as a sole crop. The main object of Mr. Andrews' work was to compare tall local sorghum varieties with new dwarf varieties both as sole crops and when intercropped with other cereals. He found that the dwarf varieties were much superior to the tall.

In his experiment he obtained 27% more total gain (from sorghum plus millet) when the sorghum was a dwarf variety than when it was a tall one. The yields were higher also from dwarf sorghum grown as a sole crop.

The reason for vastly increased yields when using dwarf varieties would appear to be partly that they do not compete so much with the intercrop and that they were able to withstand competition themselves.

A course for future research is suggested. Millet is also available in dwarf varieties and other work has shown that dwarf millet also is not so susceptible to competition. One can only speculate on the likely results of dwarf sorghum intercropped with dwarf millet.

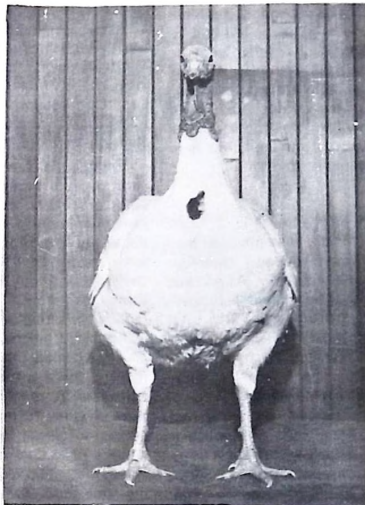
(Plant Breeding Institute, Cambridge, England. Also, Institute for Agricultural Research, Samaru, Zaria, Nigeria).

### SPRAYING COCOA INCREASED THE PEST!

That spraying against a pest can, with time, have the reverse effect to that of controlling it has been proved by Mr. J.D. Majer, of the Imperial College Field Station, Berkshire, southern England. While working on cocoa at Kade in Ghana he studied the effort of DDT spraying against the cocoa-pod-husk miner (Marmara sp).

This particular pest does not reduce yield but due to the effect it has on the husk it is often impossible to tell if the pod is ripe or not. DDT is a method of control.

Pods were studied for Mar-



### NEW BRITISH TURKEY BREED FOR THE EXPORT MARKET

*A new male strain of turkey—the "Triple 5 Male Line"—made its debut in Europe at the recent Paris Agricultural Fair held at Porte de Versailles. Developed after many years of genetic study by a famous breeding firm in northern England, the bird will economically supply high quality fresh and oven-ready, carcasses throughout the whole weight range from 4lbs, with very low evisceration loss and a high meat to bone ratio.*

*Other characteristics include improved conformation and shorter legs, giving a more compact carcass. The new "Triple 5 Male Line" is available to British United franchise breeders now and commercial poults will be on the market soon.*

*Breeders: British United Turkeys Ltd., Stops House, 25 Nicholas Street, Cheshire, England.*

### INTERCROPPING CAN BE BENEFICIAL

Intercropping—the practice of growing a second crop, usually in parallel rows between the first—is commonly practised in the tropics. The intercrop often has a shorter growing season than the other and this,

each crop because of this. But this is accepted for the benefit of harvesting two crops from one piece of land in a season. The benefits can be argued for a long time, so it is of interest when actual scientific study confirms the advantages of the practice, at least in one crop.

## AGRIC NOTES

mara damage on two plots, one of which was sprayed and on the other spraying was discontinued in December.

In the plot left unsprayed the initial incidence of damage was high in December but it dropped off in May as pods grew at a greater rate than the miner could attack them. Damage then increased and by the following December 95% of pods were affected.

### More Damage

On the plot which was kept sprayed one would have expected damage to be less. But while it built up more slowly, by the following December damage was 99.5%.

A study was then made of plots of two other places, Aburi and Amanokran, which had been sprayed only rarely. There was found to be little miner damage at these places.

It became apparent that the miner is subject to natural controls, probably in the form of parasites, which are themselves killed by DDT at a greater rate than the miner.

Mr. Majer concludes, therefore, in describing his work in the Ghana Journal of Agricultural Science, that the trees are better left unsprayed.

(Imperial College Fields Station, Silwood Park, Berkshire, England).

salts—not just on total nitrogen at all—that in most soils one can ignore it when calculating fertilizer dressings.

Pick the wrong moment, and the available nitrogen (that is, that suitable for plant use) may be right down, while the total nitrogen is high. This is because plants need their nitrogen in the form of mineral salts, either as nitrates or as ammonium salts.

If the base salts are not available in the soil to combine to form nitrates or the soil is not wet enough for the "mineralisation" of nitrogen derived from organic sources to occur, then crops will not grow. This can happen when the soil is rich in total nitrogen, but it is all organic nitrogen.

### Available Too Late

Later on, that nitrogen may be mineralised and therefore available—too late. At no time has the total nitrogen changed. Dr. Cornforth says, that total nitrogen estimations are therefore valueless, particularly in tropical soils where the situation changes rapidly.

In Trinidad, for example, more than 99% of the total nitrogen in the surface of cropped soils is contained in organic matter. This proportion may decrease to 98% in fallow soils but it still implies insufficient mineral nitrogen.

The pool of total nitrogen in the soil is replenished by the additions of further organic waste, by the fixation of nitrogen by freelifving organisms in the soil and by rhizobial bacteria. But if the conditions are not favourable to mineralisation, nitrogen is better added in the form of mineral fertilizer.

Calculation of fertilizer required on the basis of total soil nitrogen would be quite wrong and estimates undertaken on the basis of available nitrogen in the soil will just as likely be wrong for the moment the nitrogen is required by the plant.

The correct dressing is therefore best determined by ignoring soil nitrogen and, it would seem, by basing it on known crop requirements, assuming about 50% will be actually taken up.

## EXTENDING BREADFRUIT STORAGE LIFE

Storage life of breadfruit can be increased by keeping it at a lower temperature, though there is a risk of chilling damage at temperatures below 12°C. Polythene bags can extend post harvest life, as also can holding under water—a method commonly used in Jamaica.

These are the findings of a team which included Mr. A.K. Thompson of Britain's Tropical Products Institute whose brief was to investigate methods of storage for local markets in Jamaica and for export.

Breadfruits are a staple carbohydrate diet in many countries but they decline rapidly in quality after harvest. As an export product and to some extent even for local sale they are distinctly risky. Anything, therefore, which will reduce the rate of deterioration will benefit the grower.

The decline in quality is marked by a softening of the fruit and it is this the team were anxious to inhibit. Curiously, softening occurs after harvest regardless of maturity. It was also observed that allowing the fruit to fall to the ground as a means of harvesting has no accelerating effect on the softening process.

(Tropical Products Institute 56 Grays Inn Road, London WC1).

## INSECTICIDE FOR CITRUS FARMERS

A new insecticide, called "Amitraz," has been found by the Boots Company Ltd, Nottingham, England, to be successful against several pests of citrus.

Boots, a household name for pharmaceuticals in Britain, has also been a manufacturer and formulator of crop protection chemicals—originally for gardeners—for some time. The company's business with British farmers has recently been expanding enormously, but Boots is still a relative newcomer in the matter of supplying its products to overseas farmers. Recent research indicates, how-

ever, that the company has one or two products suitable for the tropical farmer—and Amitraz is one.

Mr. D.N. Weighton, of the Boots research station at Lenton, Nottingham, has found that Amitraz controls citrus red mite (*Panonychus citri*) and wax scale, such as white wax scale (*Ceroplastes destructor*).

Citrus red mite has been controlled with 0.02% active ingredient and wax scale with 0.04%—0.05% active ingredient, with or without the addition of white oil.

California red scale (*Aonidiella aurantii*) at high population rates have been kept in check.

(D.M. Weighton, The Boots Company Ltd, Lenton Research Station, Nottingham, England).

## WEED CONTROL BOOST

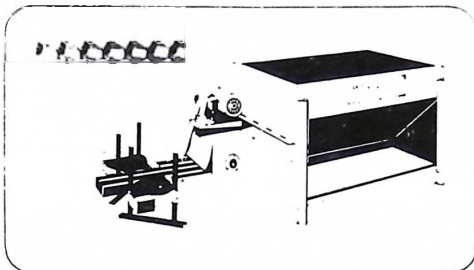
Ammonium salts are recommended by the Weed Research Organisation, Yarnton, Oxfordshire, as an occasionally viable boost to the effectiveness of foliage-applied water-soluble herbicides.

The addition of ammonium salts, say the WRO, can sometimes increase this effectiveness by up to 400 per cent. Since ammonium salts are not only safe to handle but quite cheap, cost-saving would be an added benefit.

## IGNORE THAT SOIL NITROGEN

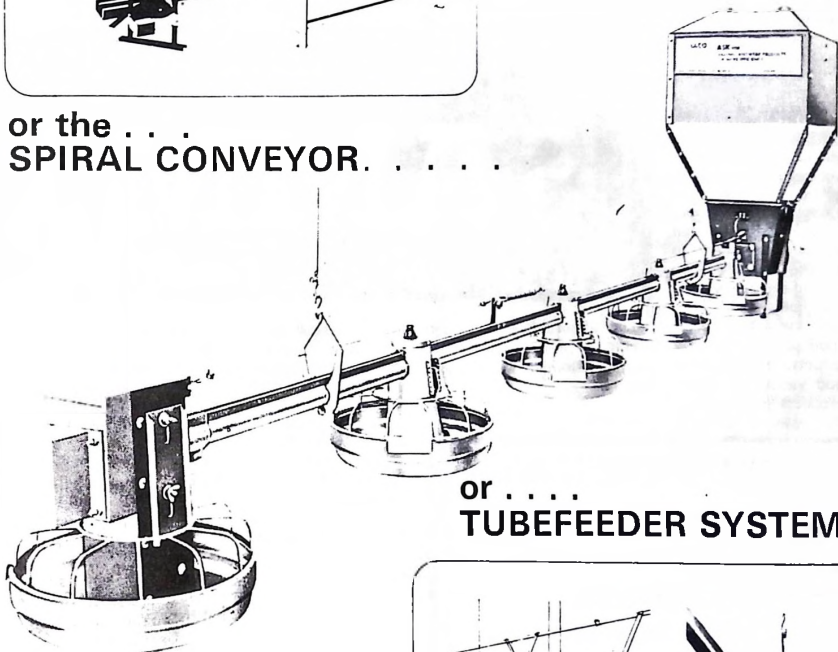
All plants, crops included, require nitrogen. And it is often concluded that if nitrogen is present in the soil, it will be available to the crops grown on it. Nothing could be further from the truth, says Dr. I.S. Cornforth, of the Faculty of Agriculture, Queen's University of Belfast, Northern Ireland. He has done extensive work on nitrogen in West Indian soils and has come up with the conclusion that the nitrogen available in the soil at any one time depends so much on vegetation, rainfall and soil drainage and the presence of non-acidic

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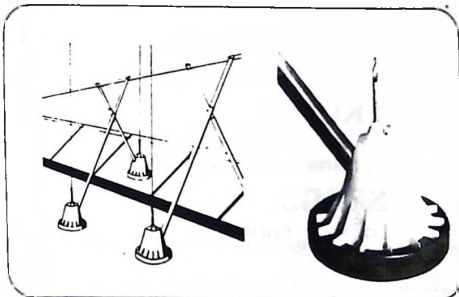
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Every calling, vocation, profession or 'what have you?' has its devotees. Not a few for some inexplicable circumstances stir new courses in life occasionally.

A few others for monetary considerations go into certain businesses with a view to siphoning out as much money as possible in the shortest possible time when the going is good. But some others are driven by some urge to provide essential services shunned by many for various pardonable reasons.

Farming is one such venture. To set up farming much is involved namely capital, land, labour and organisation; but above all, a stubborn will to succeed. Besides, farming hitherto has been despised, unaided by the powers that be and regarded as the last resort for failures from other walks of life but who are too honest for absorption into the underworld.

But when a young chap with all the prospects of a comfortable white collar job abandons cozy life for one of continuous exertion and experiments, that one must be a visionary to know that the new line being trodden would eventually yield profits many folds.

Everyone now knows the cost of food particularly farm fresh products, and he who has a good variety of much-needed products is in money.

But how many can pay the price and wait till the profit margin is reached? Quite a few.

### Beautiful Vegetable Beds

To an unobserving eye, the scenery is just bush, ordinary thickets as one heads for Agege after sighting a few planes on the tarmac at Murtala International Airport, Ikeja. But a more careful study of the bil-

Pawpaw trees line the lanes on one side at 3m intervals. The local vegetables plots raise spinach, (sokoyokoto) and a wide variety of other species.

As in all up-to-date businesses which must continually serve its customers perennially, the Ajayi Farming Enterprises Limited have water always. An artesian well oozes out water which is mechanically pumped

by Our Staff Reporter.

## FARMER OF THE MONTH

# SAMMY

## BOSS OF AFE FARMS

One of such few is the farm director of Ajayi Farming Enterprises Limited, Ikeja, Lagos State.

lowing trees and pawpaw trees will reveal some orderlines in the bush, a further gaze will confirm that a well-organised farm is on there.

A two minute drive along Agege Motor Road from the airport, takes one to the main entrance of Ajayi Farming Enterprises Limited, owned and managed by a young unobtrusive Nigerian farmer.

The order and organisation on the farm would easily suggest an elderly someone but enquiries would reveal that the 'big farmer' one is looking for is the man among the workers himself busy passing orders and executing some of the instructions personally.

On entering the sixty-acre farm one comes into a forecourt with an administrative unit on the right. Here a well-organised office betrays the director's early life as a stenographer.

Quite in time with the rush for fresh products, a modern shop displays luscious farm products and provisions.

Behind this modern shop are rows and rows of crops. Here are stretches of lettuce, over there cucumber, and yonder are tomatoes, pineapples and sweet pepper. The whole twenty-five hectare farm has been plotted out into sections of 35m x 17m with lanes in-between the plots.

out into a reservoir from where after treatment the water is stored in a tank.

### Planned Farming

The Tank feeds the whole farm clean water for all purposes as pipes-lines have been buried in a grid system to cover all the plots. At regular intervals water storage concrete reservoirs stud the farm; from these small reservoirs and taps the whole farm gets a sufficient sprinkling of water. Cheerful labourers can be seen with watering cans going round the beds morning and evening.

The livestock division is no less interesting. Pigs, goose and geese as well as chicks are quartered neatly in their various ages.

In fact, life is a closed unit on Ajayi Farming Enterprises Limited; manure (droppings) from poultry section is spread on the beds where roughages are brought to feed the pigs.

A most interesting aspect of the activities on the farm is the nursery and experimental sections. Many foreign plants are grown in the nursery. On showing signs of adaptability to local conditions, such plants are again transferred to the farm on experimental basis.

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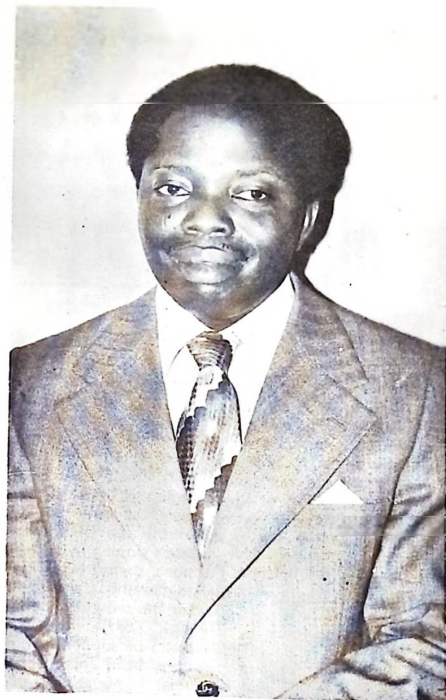
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Mr. Samuel Adebayo Ajayi,

Here, they are watched and studied until an assertion can be made on them.

One such plant is the Asparagus. It is a soft edible offshoot of a wiry plant. It takes about four years for asparagus, a much-relished foodstuff among Europeans, to mature.

It can be seen that much money would have gone into raising it before it comes to the market stall. Such a pioneering project is just one of a few of the bold schemes undertaken by the young manager.

Quick action, a necessary quality of good manager, is inborn in Mr. Ajayi. Before his poultry section could feel the pinch of feed and absolute dearth occasionally—a situation that had ended many poultry ventures—Mr. Ajayi wittingly set up a feed mill. From scratch, he has built up a renowned feed—AFE FEEDS—now a household word among livestock and poultry breeders.

### Background

Mr. Samuel Adebayo Ajayi, 38, a Yoruba man from Ijebu-Igbo, Ogun State, had his early Secondary School training at Macjobs Commercial School Abeokuta.

In 1960 he won a scholarship in that School. By 1961 he had become a Bursar at St. Andrews College, Oyo, with Rev. Seth Irunsewe Kale former Bishop of Lagos, as Principal.

After a few months he was bored with routine work and had to shift to Lagos to put his secretarial qualifications to good test. So he became the Secretary cum Shorthand typist of the defunct Nigeria Fishing Trading Company Limited. That company soon folded up. Young Ajayi also folded up the idea of any sedentary job.

He took off for the United Kingdom to widen his horizon business-wise and returned in late 1962. Although a qualified

stenographer he intuitively started a food supply service.

That was a most consequential step which he took.

### Supply Service

Soon Ajayi was buying up almost all the Government Farms, Agege, were producing in fruits and vegetables and had much trouble in being allowed to do wholesale purchases. "These farms are for demonstration," the officers always told him.

But mother providence stepped in opportunity through one Mr. J.C. Miller, adviser to the then Western Government on Agriculture, who advised him to set up his own farms. So, to prepare himself properly, Ajayi flew out to Iowa State College, U.S.A. and had a proper grooming in farming at Plant City, Florida between 1963 and 1964.

By the middle of 1964 he was back to set up the present farms around kilometre 19 Agege Motor Road, Ikeja. In all, the farm then was a little more than 2 hectares but has

Continued on P 26

# FARMSTOCK

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# Who is a FARMER Asks O

The basic difference between native vegetation and wild animal life on the one hand, and agriculture on the other, is the presence of a farmer. The energy of the sun hits the surface of the earth everywhere, whether any human being is present or not.

Wherever the temperature is right and moisture is present, plants grow and animals live.

It is man who takes control of this situation, learning to use the products of plant and animal life, modifying plants and animals and the nature of the soil to serve his purposes better, and the man who does this is the farmer.

In the operation of his farm, each farmer plays two roles. He is at the same time a cultivator and a manager.

## The Farmer As a Cultivator

The first role of each farmer is to take care of plants and animals in order to get useful products. With respect to plant growth, this includes the preparation of a seedbed, the sowing of the crop, the elimination of weeds, the management of soil moisture, and measures for the control of pests and diseases.

With respect to animal growth, it includes controlling the breeding of livestock, herding and feeding them, protecting them from diseases, and, where necessary, housing them.

Some of these tasks are part of even primitive cultivation, while others are added step by step as farmers progress toward the establishment of modern farms.

Not only are new tasks or cultivation added as agriculture develops, such as the placement of fertilizer, the more careful application of irrigation water, and the application of insecticides and pesticides, but farmers have to learn to do the old operations of ploughing, seeding and weed control in new ways.

## The Farmer As a Manager

The other role of the farmer with respect to the farm he operates is to be a manager. Whereas the skills of cultivation are mostly skills of the hand, the muscles, and the eye, the skills of management involve activities of the mind backed up by the will. They involve primarily the making of decisions, or choices between alternatives.

The decisions each farmer

must make as a manager include choosing between different crops that might be planted in each field, choosing what livestock are to be kept on the farm, and deciding how to distribute available labour time among different tasks, especially at times of the year when

must decide how much of each crop is to be kept for home consumption and how much of it is to be sold. He must decide when to sell his products and to whom to sell them.

The managerial task of buying and selling are not a part of the role of the farmer in a



Mallam Bako Mohammed Nasiru a Nigerian, an agriculturist in the U.S.S.R. Farmers have a lot of problems to contend with but usually receive little or no help from the Government. Unless something timely is done to encourage farming, qualified people like Mallam Nasiru may abandon a vocation to which they would have been devotees to the good of all.

several different tasks need to be carried out at the same time. They include choices as to what and how many draft animals are to be kept for work in the fields.

As agriculture progresses, the farmer must develop more and more skills in buying and selling. He must decide whether or not he will purchase improved seeds, fertilizers, insecticides, or new implements. He

wholly subsistence agriculture where no supplies are purchased and where all of the products are consumed by the farm family. But agricultural development depends on farms becoming more "commercial," with more and more purchases of production supplies and equipment, and more and more sales of products in the market.

The managerial tasks of farmers are made more difficult by

the great variety of local soils and climatic conditions mentioned in the preceding article.

If the soils of each farm in a region were just like the soils of all other farms in the region, if the slope of the land were the same and the effect of the sun were the same on lands sloping in different directions, then it would be possible to develop standard "recipes" for the most productive use of each field, and each farmer could be supplied with instructions from some expert as to what he should do and how and when he should do it.

But in the real world of widely varying agricultural conditions even within short distances, including differences in local prices of farm supplies and farm products, most of the managerial choices about the operation of each farm must be made by the operator of that farm.

Consequently, it is important to agricultural development that farmers grow in managerial ability so that they may confidently take advantage of every opportunity open to them, each to make his farm as productive as possible, with an increasing margin between the costs and the returns of his farming operations.

## The Farmer As a Person

The farmer is more than a cultivator and a manager. He is a person and a member of two groups of persons that are important to him. "He is a member of a family and he is a member of a local community or neighbourhood. Much of what a farmer is as a person he

# MEASURING

Include one that you consider progressive and one you consider backward. Ask yourself why one of them works (if he does). Ask yourself what, to your knowledge, each has learned in the past year. Why, in your opinion, has he learned that?

So far as you know, has any one of them developed a new way of doing something on his farm? To what does each of them aspire? What does he want or hope for from life? It would be better to do this for twenty farmers than for three, to insure a more realistic variety

sions about farmers as persons.

Farmers vary enormously as persons. Most of them work pretty hard. They learn a little, but not much, from year to year. They seldom develop new methods; for the most part they use the methods of their fathers and occasionally pick up a new one from neighbours. What they hope for from life may be a modest improvement on the past, or it may be simply that they be spared from hunger, illness, and the death of their children. They hope that they can keep the land they have or even that they can get a little more.

owes to his membership in these two social groups. Much of what he can do as an individual is determined by them.

As persons, farmers have four capacities of importance to agricultural development: to work, to learn, to think imaginatively and creatively, and to aspire.

It is each farmer's ability to work and to learn, at least to the extent of mastering the skills of cultivation practiced by his father, that enables him to be the cultivator and the manager of a farm.

It is the farmer's capacity to learn new techniques and master new knowledge beyond that possessed by his father that makes it possible for him to change his methods so that agriculture becomes more productive. It is their capacity to imagine and create that enables some farmers to find entirely new and more productive ways to operate their farms.

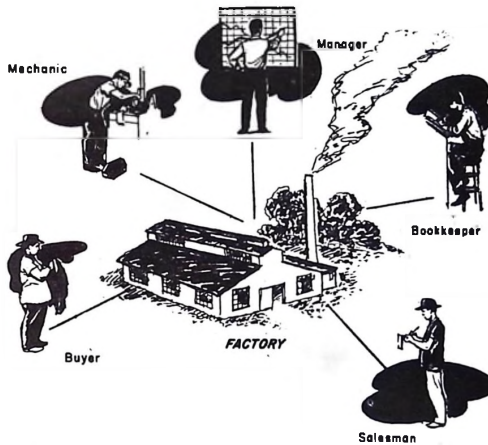
To aspire, to long for something better than one has or is, can be a powerful stimulant under certain conditions.

First, a person must have a vision of a better way of life that he believes is possible for him.

Second, to keep this aspiration alive and make it a powerful drive, he must make enough progress toward the goal that he feels it worthwhile to keep striving.

It is easy to make the mistake of thinking rural people do not really want a better life just because their aspirations seem modest. But rural people in poor countries are not alone in this. Few of us "ask for the moon," what we aspire to is a

little improvement over what we have, or are, at the present time.



In factory production different persons perform specialized services.



Cultivator      Manager      Bookkeeper      Buyer      Seller

Most farm operators must perform all functions.

### Characteristics of Farmers

Think, for a few minutes, about three farmers you know.

of persons, but three should illustrate what we are trying to examine here.

From this exercise, you can probably draw certain conclu-

### Mental Habits

Three mental habits are particularly important to agricultu-

# OFN: Can it succeed with the hoe?

asks Abiodun Ojugbele  
Managing Editor,  
Farmstock Magazine

Perhaps the most topical economic issue nowadays is the 'Operation Feed the Nation,' the echo of this agricultural reawakening reaches the very limits of our country resulting in a general reappraisal of Agriculture.

*Much as everyone is alert to agriculture what readily comes to mind is planting while breeding of birds, animals (cattle & rabbits) and fish are either forgotten or temporarily shelved. The idea of everyone planting something is an attempt at ensuring mass production. To achieve sufficient production thereby lowering prices, the hoe is the last implement to accomplish such a feat for obvious reasons.*

In this jet age how many can stand the pain of bending to scratch on a tough bush in an attempt to clear an area for planting? Against the hoe is also time since there is a limit to how much can be cleared within a short time with a hoe.

Nevertheless, the hoe can still come in for some patches of land around the house or other small plots but when State Governments are spending huge sums of money on hoes and cutlasses definitely a misuse of money is apparent. Mass production does not entail an army of workers, but an organised few assisted by mechanical tools and equipment, to produce large quantities. While the OFN as a Scheme is commendable, it is hampered from

the take-off by a few setbacks namely high cost of labour arising from the Udoji Award hence there is a drift from farmsteads since farmers cannot pay the high rates. In effect, the work of about 5 workers now devolves on one person.

some places have naturally fertile soils.

The Northern parts of Nigeria which should serve as the Nation's grainery is also left to the hoe. Patches of subsistence farming a few metres thick skirting the roads are all that

the launching of the scheme by the Head of State, Lt-Gen. Olusegun Obasanjo, a Development Plan Programme should have been evolved so that in a few years hence, all the facets of a planned agricultural revolution would have been touched.



Flashback to the launching of Operation Feed the Nation by Lt-Gen. Olusegun Obasanjo at Doddan Barracks. On the left is Brigadier Yar Adua.

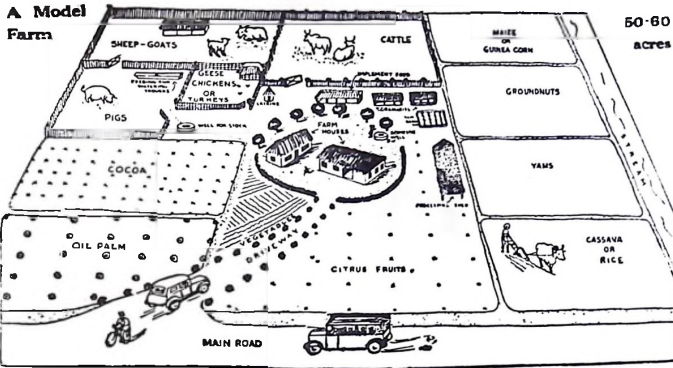
To cope with such a situation only mechanisation but not hand tools can help. All over the countryside, the only visible thing is the fertilizer, heavily subsidised for that matter nothing after that. But not everywhere needs fertilizers since

can be noticed in any extensive tour of the northern states. In some places, the fever of OFN has died down completely.

## Development Plan

But the OFN must succeed if properly prosecuted. From

The first year should be concerned with organisation of plots. Farmers are to be helped to acquire large plots either by fusion or purchase; such an exercise will go pari-passu with the traditional method of hoeing until tractors take over.



Each state will then register as many farmers as have acquired a minimum of (say) twenty five hectares (60 acres). Each farmer with so much land in a lump must have a tractor, it should be as simple as that.

The list will determine how many tractors are needed and where to locate Tractor Hiring Units for those who have large tracts but not up to twenty five hectares; such depots should be sited at nodal points.

Fertilizers, seeds and day-old chicks must be heavily subsidised so that the cost of products and chicks can be tolerable. As at now, only a few can afford an egg a day for each member of a family and far less can afford a chicken weekly. Until local grains are around plentifully all inputs must be subsidised by the State and Federal Governments.

### Homesteads

The scarcity of cow meat prompted our late Head of State—General Murtala Mohammed—to start importation of meat from Argentina. Our foreign exchange is being reduced by the amount of imported meat while the exporting country's agricultural economy is being boosted on our stomach. While the exercise lasts animated organisation should be stepped up to stabilize our nomadic herdsmen in homesteads.

Besides, private ranches should be encouraged as in poultry. It is only when ranches are many that the cost of cattle can go down as well as all the

bad practices by middlemen now. Most of our people now live on the hide—Ganda (Hausa) Kanda (Ibo) Pomo (Yoruba)—although it is tasteless, non-nutritious and often-times the breeding ground of many animal skin diseases.

But for the burning and cooking, various diseases would have attacked many families as a result of eating Kanda. An

are usually stung.

Even then poultry needs a lot of helping. Feed accounts for about 70% of the cost of raising a chick either for table or egg production. Grains should be subsidised now. Imported day-olds are by far cheaper than local ones because feeds are heavily subsidised overseas.

If production must exceed



enterprising fellow may start collecting old shoes to be turned into Pomo any day and he will make money on our stomach.

### Poultry

Of all our agricultural pursuits poultry seems to be the only well-organised not because any one wishes it to be so but because the industry is an offshoot of European systems. Those who go into it anyhow

consumption, then preservation becomes a desideratum. To produce broilers economically and profitably they have to leave the farm at about 10 weeks. Any extra day lowers the profit, toughens the meat and disturbs breeding the programme. Processing Plants at nodal centres to absorb chickens will boost production and stabilize prices.

Poultry has become a developed industry but no more the appendage of veterinary; as such, putting poultry under a Veterinarian is like asking a wood worker to supervise a metal furniture plant.

### Extension Services

Government should concern themselves with Extension Services which are almost defunct now. Government servants should not handle production which hitherto has constituted a terrible waste of cash and man power.

Production cannot be handled with red tape protocol. Birds and animals die by the hundreds daily but salaries are sure. Local purchase Orders are issued for unnecessary stores and equipment for kick-backs.

Training is also part of Government concern. Primary School Leavers and any who wishes to go into Farming should have opportunities in Agricultural Schools. Workshops for the training of mechanics for Agricultural equipment should be studded all about important centres so that farmers do not have to look for them vainly due to long distances. Farmers too need be taught simple repairs.

The Cooperatives have their parts to play. They can handle purchasing, storage and marketing. It means that for them to come into the show they need some organisation.

### Repayment of Loans

While farmers are to be helped with loans at reasonable interest rates, payment is better made in kind but not in cash. Several other countries have adapted the method of payment by farm products. Such a plan cuts off the avaricious middlemen and encourages the farmer to maximize production.

The hoe has played its part. It can still be used in some ways but it cannot help the country now. So the switch must be to mechanised farming.

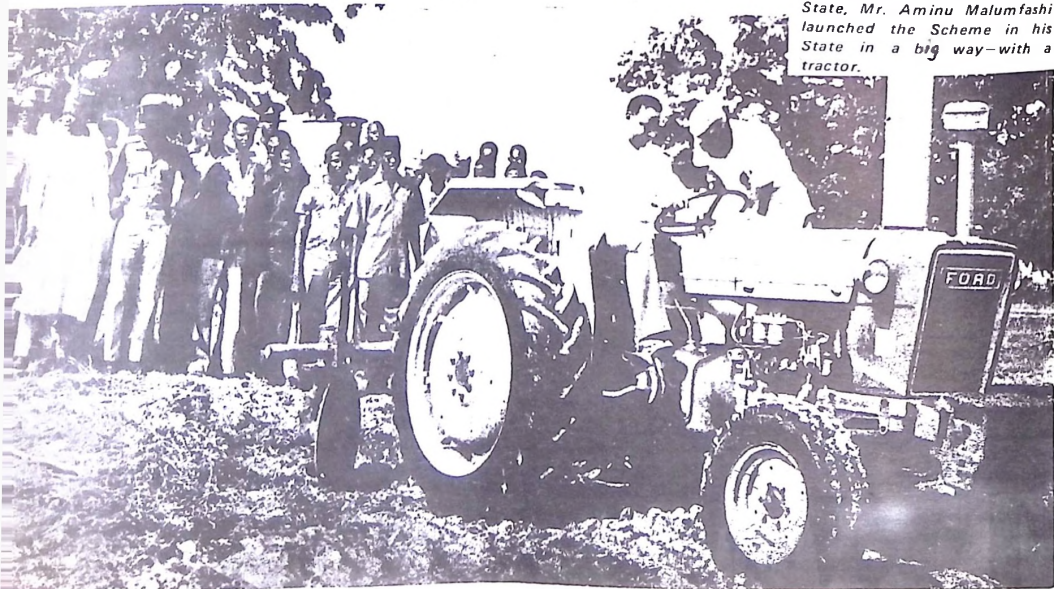


'Example is better than precepts' seems to be the opinion of the Lagos State Governor, Commodore Adekunle Lawal in picture (top left) when he visited Temu Agriculture Centre, Epe, recently to see the progress of the Operation Feed the Nation there. The Governor is seen tearing a bush down with a cutlass. Yes! the 'Operation Fyed the Nation' has started with a right foot forward.

Religious sects have also found common grounds in the OFN. In top picture, Alhaji Sani Waliki (turbanned) village head of Barnawa, Kaduna State, teamed with the Spiritual Leader of the Cherubim and Seraphim Society, Mr. S.O. Kale.aiye to launch the Scheme in their area.

In the middle picture (left) the Oluwo of Iwo, Oyo State, with Lt. Col. E.A. Utuk of 6 Infantry Brigade, Akure, launched the OFN spearheaded by Ex-servicemen of the Oba's domain.

Below (left) the Deputy Commissioner of Police, Barso State, Mr. Aminu Malumfashi launched the Scheme in his State in a big way—with a tractor.



## OPERATION FEED THE NATION

# A Countrywide Affair

There had been nothing that caught everybody's fancy as the current Operation Feed the Nation and there might be nothing to touch people's mind equally so in future.

The equal fervour shown countrywide for this project underscores one Nigerian saying that "Words do not pinch everyone equally but hunger does."

The once despised vocation has become the darling of all and sundry overnight as these pictures show albeit pretentiously. What we at FARMSTOCK are happy about is that when all the 'Fanfare' has died down, some will stay with Agriculture. Such will be among the few to realise that Agriculture too offers all the attractions usually sought after in any other economic pursuits—medicine, engineering etc.—i.e. comfort, but even more. Agriculture offers true independent private life and real legacy. You are on the right track to a peaceful life if you pursue agriculture; please start today.

*The Police Force has not been left out. Below a Police Chief (Kaduna State) sows seeds with others while artful drummers thrill everyone around.*



Above, Dr. C. Oyolu (centre) with others harvest maize in an CFN plot belonging to Mazi B. U. Osuorah of Anambra State.



## farming in other lands



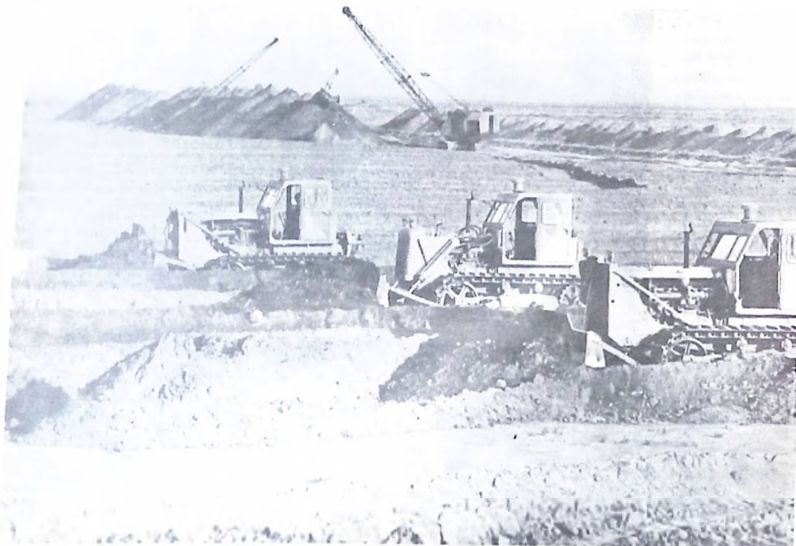
### BRITAIN 'NETS' A NEW TRAINING CENTRE

Fishery development officers checking the rigging on a trawl before it is launched into a new test tank—the largest of its type in the world—which has recently been opened at the British White Fish Authority's fisheries training centre at Hull, Eastern England.

The tank is 31 metres long and 2½ metres deep and enables very large mid-water trawls to be tested at one-fifteenth scale and traditional bottom trawls at one fifth scale. Taw-

ling speeds up to 13½ knots can be simulated.

The opening of the new centre with its 154,000 gallon (700,000 litre) tank will enable large scale models of trawls and other types of fishing gear to be demonstrated and tested. It will enable fishermen to see—how their trawls behave under operational conditions below the surface of the sea. They will be able to assess how changes for improved earning efficiency can be made and how their trawls are affected by external factors such as ship speed.



### THE LARGEST ARTIFICIAL RIVER IN THE WORLD

*Builders of the Karakum Canal (Central Asia) have passed the 970 kilometre mark. The world largest artificial river is moving ever farther to the West. The Karakum Canal begins at the Amu Darya River in the Western part of the Turkmen Soviet Socialist Republic. It flows through the quicksands of the Karakum Desert, irrigates the fertile soil of the Maryskiy and Tejenyskiy oases and now it is directing its course towards the subtropical districts in the south-western part of the republic.*

*Hydrotechnical work is continuing along the entire length of the Karakum Canal. In its first sections the canal is being widened and the water supply is being increased.*

*The operating canal track today irrigates 350,000 hectares of land.*

*The Karakum Canal has transformed the most arid republic of the Soviet Union (deserts occupy nearly 80 per cent of the territory of Turkmenia). If before the arrival of the waters of the Amu Darya Turkmenia produces less than 400,000 tons of cotton (its main agricultural crop), in recent years the cotton crop totalled one million tons. After Uzbekistan the Turkmen Republic has become the second biggest cotton producing republic in the Soviet Union. Agriculture which substantially improved due to the canal, had repair long ago all construction spendings.*

*Picture depicts construction of the fourth section of the Karakum Canal in Turkmenia.*

## THE NEW DALTON COW CALCULATOR

This is an essential aid to profitable livestock breeding.

Just turn the calculator to the service date and straight away you have the other dates relating to next heat, pregnancy test, correct dry period, steaming up and calving date.

The two-colour durable plastic calculator is simple and easy to use. A must for dairy herd management.

Price: (£3.50) = \$3.00 each plus 24p post/packing and VAT. (U.K.)

Dalton are well known for animal identification equipment and the large all-flexible Riese Tag is proving to be an unqualified success.

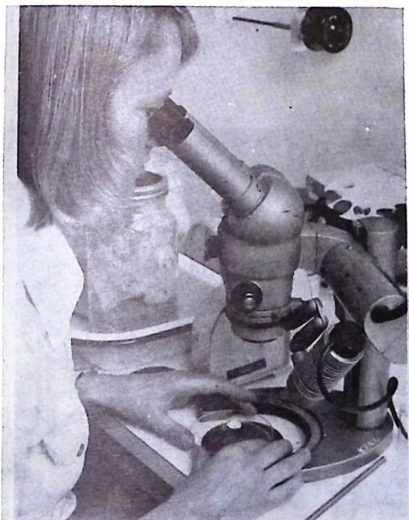
For further information please contact:

Dalton Supplies Ltd.,  
Nettlebed,  
Henley-on-Thames,  
RG9 5 AB  
Telephone: Nettlebed 457  
Telex: 847547



## PHOTO NEWS

We welcome pictures of Agricultural Events all over the Federation on this page. Publication is free please — Editor.



### SCENTING OUT A WAY TO SAVE FOOD

As every female knows, there is nothing like an alluring scent to turn a virile male's mind to thoughts of love! But it could also help save the world thousands of tonnes of food each year. For attractive scientist Dr. Barbara Barratt, at the Zoology Department of Durham University, in north-east England is trying to isolate the "love" scent of a tiny beetle, the larvae of which causes havoc in a variety of stored foodstuffs and products including grain, flour, coffee, tea, tobacco, wood, leather and animal feed pellets.

The beetle is the tiny *Stegobium paniceum*, or biscuit beetle. In order to attract the male of the species, the female produces a sex scent which can be detected over varying distances. If Dr. Barratt is successful in isolating the smell, then she thinks it will be possible to reproduce it artificially. It could then be sprayed around warehouses, confusing the male beetles so that they could not locate the female or, saturating them with the smell to an extent that they would no longer react to it. As the breeding period of the beetle is only six weeks and requires fairly high temperatures and humidity, Dr. Barratt believes an infestation could soon disappear.

## FISHING

# ARTIFICIAL LAKES MAY BECOME NEW SOURCES OF FOOD

by Christine Griffiths

Inland fisheries on the huge man-made lakes provide an inexpensive and nutritious source of food as well as employment for large populations in Africa. As the water was filling in to create yet one more hydroelectric reserve lake behind the Cabora Bassa dam in North Mozambique, scientists were considering the most economical ways of establishing a local fishery. But given luck, nature would provide its own answer.

For the Cabora Bassa lake, eventually to encompass some 5,000 Sq. Km (2,000 Square miles) is feeding on the Zambezi river downstream from the Kariba dam in Central Africa. Behind the Kariba Dam lies another hydroelectric reserve lake and the site of an already well established fishery. "New Scientist," the authoritative London journal, explains how lake Tanganyika sardines were successfully introduced into Lake Kariba some years ago. The operation was expensive but worthwhile as catches of up to three tonnes per night are now possible by a single fishing unit.

### Leader in fish farming

The journal reported that because of this success an attempt was made to introduce the sardines to the Cabora Bassa water, a great deal of time, trouble and money would have been saved and a readily exploited source of food would become available to the people of Mozambique.

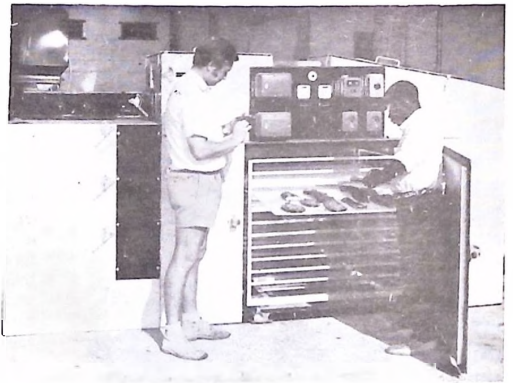
There are signs that this is already happening. Evidence that Kariba sardines have survived the hectic passage through the machinery of the power station suggests that they may well arrive and successfully breed in the new lake downstream.

British scientists observe the Cabora Bassa fish-watch with more than academic interest. Britain's own White Fish Authority is a world leader in fish farming and its specialists assisting colleagues in Africa and elsewhere are making an important contribution to commerce and development. One such specialist is currently engaged in the establishment of a similar industry in Trinidad. And the London-based Tropical Products Institute (TPI) recently established a fully equipped fish research laboratory at Namiasi in East Africa.

A recent TPI discovery which may soon be put to profitable use on Lake Cabora Bassa concerns the preservation of fish. Scientists found that fish caught in tropical waters will keep fresh in ice much longer than fish taken from temperate waters. This means that fish packed in ice can be distributed widely the period of its freshness, which may last up to three weeks. At present, most of the fish is sundried—but this is not possible the three to four months of the rainy season. New techniques of smoking fish have also been developed by TPI in London and commercial introduction in East Africa is expected soon.



*Two fisheries experts from Britain on the pier at Namiasi on Lake Malawi. Fish is the main source of protein in this southern African State and Britain provided aid to establish an effective government fisheries service.*



*A British fisheries expert inspecting smoked fish in the Torry smoking kiln at Namiasi on Lake Malawi. A study of fishing took place on the Lake and centralised fish landing was encouraged with the provision of freezing and cold storage facilities.*

Continued from p. 17

## THE FARMER, WHAT IS HE ?

ral and all other kinds of) development.

● One is the habit of measuring; thinking in terms of amounts of things. This habit leads a person, in looking at a harvest, not to be satisfied with considering it a "good" harvest but to ask exactly how good it is in terms of kilograms, maunds, or bushels per hectare, bigha, or acre.

● The second useful mental habit is that of always asking why. Why is this crop better than that? Why is this field less fertile than that?

● The third is the habit of constantly looking for alternatives, for other ways of doing anything one has to do. Always considering alternative can become as much of a habit as always doing something in the same way.

But habits can also be a nuisance and an obstacle. They make it difficult to learn new ways of doing old tasks. They make it difficult to consider new methods. Persons frequently come to consider their habitual behaviour as an essential part of being themselves and feel they are traitors to themselves if they shift to a method suggested by someone else. All of us do this to some extent.

Habit is like friction in the physical world. Whether it is an asset or a liability depends on what is being attempted at the moment. Friction is an asset in the brakes of a bicycle or automobile, it is a liability between the moving parts of a pump or engine. With respect to agriculture, habit is an asset in carrying forward activities that have previously been learned, but it can be a liability with respect to the learning of new techniques.

But our main point here is that most farmers live far below their capacities as persons, and one of the tasks of agricultural development is to help them, and make it easier for them, to develop as persons so that they regularly use much more of each of the capacities they have.

The third conclusion you can draw from thinking about your farmer friends is really a group of conclusions about why they do the things they do, and are the way they are.

Here we cannot generalize very much and readers in different parts of the world will come to somewhat different conclusions because of the different societies (cu res) in which they and their farmer friends live. Consequently, we shall state only tentative generalizations here, in the form of questions for each reader to answer for himself.

Is it not true that farmers farm for what they, themselves and their families, can get out of it either in goods or in personal satisfaction? Very few of them have any sentimental attachment to cultivation for the sake of cultivation.

Some of them genuinely "love the land" but they want more from cultivating it than pleasant exercise in a favourite setting. What all farmers want is food and fibre and money with which to buy other commodities for family use. They want family security.

They may in addition (and many of them do) get a feeling of pride and satisfaction out of doing their work well and even out of farming more successfully than their neighbours. They may get even more satisfaction if their achievements are recognized by others in the local community.

### Shrewdness

Is it not true that farmers are so aware of uncertainties of the weather and of prices that they are reluctant to try a

new method unless they are sure it will succeed? Much of the "conservatism" of farmers is pure shrewdness.

They are too smart to take chances, particularly if they have few savings, have small farms, and live near the margin of subsistence. To overcome this wise conservatism any new method proposed must promise very substantial increased returns.

Is it not true that most farmers place a high value on the goodwill and approval of their families and neighbours? Money is not everything. Friendship and social approval are important to most of us. We fear ridicule and we fear being shut out from the companionship of our fellows even more. Farmers share these feelings. Their behaviour reflects this. Part of the task of agricultural development is to take measure that shift the climate of social opinion from respecting those farmers who farm in the same old way to honouring those who climb to higher productivity through changing their methods even when this involves risky experimentation.

Is it not true that the most progressive farmers are those who have the most confidence in their own judgment and who may feel less personal need for the approval of others? They are less fearful of ridicule because they are sure that even if they make a mistake they can correct it and succeed the next time, or the next.

Such persons become the pioneers, the "innovators" in each society. While they seem to have less regard for the immediate approval of friends or neighbours, they are not unaware of it. They simply have confidence that in the long run they will succeed and gain this approval. Whether they actually receive approval in their lifetime or not, the progressive development of each society is actually led by, and built upon, the accomplishments of such persons.

Is it not true that farmers resent being pushed around and told what to do? All of us do.

Farmers want to be treated as human beings, as persons, as intelligent, responsible persons. They can accept help and advice from others only to the extent that doing so does not violate their own self-respect and their own integrity as persons.

Continued from p. 9

### POULTRY

les, and probably hypertension.

The supply problem is one reason why it often pays to start on a new site rather than take over an existing unit. Apart from numerous other good arguments from starting from the scratch, there is the difficulty of ensuring that the existing water scheme is accurately charted and soundly constructed.

Nearly all the rain that falls is lost by evaporation or through the transpiration of plants. Whether the remainder is saved depends largely on us as poultry farmers individually, and the nature of the soil. We should remember that water can be conserved on the farm by damming streams or excavating wells or reservoirs.

### BABY RABBITS THRIVE

By rearing baby rabbits artificially in an incubator, scientists at the Rowett Research Institute in Scotland have reduced mortality during the first 14 days from 20 to only 3 per cent.

One of the difficulties of rearing rabbits in cages is that the doe has no instinct to retrieve her young and this can cause losses—the young are born without an external coat and, although blind, are able to propel themselves forward.

In the wild, they are born into a nest at the back of a tunnel whose shape causes straying pups to fall back into the warm nest; but in a rabbitry where nest boxes have to be big enough to admit the doe, it is easy for the young to stray and become chilled.

Continued on P 26

## NEWS

He further said that as soon as fund was available, they would raise cattle and pigs, and develop fish ponds.

### RIVERS STATE

If chemicals are wrongly applied to crops they become harmful. To this end, an experimental farm is now being planned to educate farmers on the usage of fertilizers. Such farms will be located in Ogba Egberma Division.

Announcing this, the chairman of the state's "Operation Feed the Nation" committee, Dr. N.O. Isirimah said it would reduce the problem of the application of fertilizers. He further disclosed that crops like pepper seedlings, corn and tomatoes would be distributed to farmers before the next planting season.

The material, he further said, would be sold at subsidised prices to farmers and free to schools that have farms.

### BENDEL STATE

The group director of public affairs of Bifco Ltd. Lagos, has donated two units of agrochemical insecticide sprayer to the Bendel State Government. The present was made to the State's Commissioner for Agriculture and Natural Resources.

### PLATEAU STATE

At the launching of the Operation Feed the Nation at Langtang, the Sole Caretaker Authority in charge, Alhaji Bawa Ahmed, announced that over 15,000 bags of fertilizers had been sold, adding that over 13,000 bags of fertilizers, 5,000 small hoes and improved seeds for sale to farmers at subsidized prices were still in stock.

He further disclosed that the division would be supplied with day old chicks, cages of poultry units, cutlasses, tractors and threshers. The items he disclosed were expected.

### BENUE STATE

In the later part of september, the Yandev farm centre celebrated its golden jubilee. The Military Governor, Col. Abdullahi Shelleng declared the jubilee opened by unavailing its tablet.

Among the highlights of the ceremony was the crowning of

Miss Mbakaren as Miss Yandev. Distinguished personalities who attended included the Och'Idoma, Mr. Abraham Okpabi, the Atta Igala and the Tor Tiv, Gondo Aluor.

### NIGER STATE

At the graduation ceremony of rice production staff at the National Cereal Research Institute at Pategi, near Bida, the Military Governor of the state, Col. Murtala Nyako advised that research institutions and organisations charged with the agricultural development to use farmers in carrying out their Operations.

He further said that if this advice was heeded farmers would be attracted to research innovations.

In a welcome address for the Governor, the Director of the Institute, Dr. O.A. Atanbe announced that 24 varieties of rice has been adopted for rice producing areas of the country.

### BAUCHI STATE

The low agriculture production in Gombe area has been attributed to soil erosion.

This was disclosed by experts invited by the state Government to find out the ways and means of tackling the problem.

Announcing this, the Divisional agricultural officer Malam Jibrin Zwala said the experts were drawn from Ahmadu Bello University Zaria.

### IMO STATE

Tractor hiring service has been introduced into the state's Ministry of Agriculture and Natural Resources.

Under the programme the Ministry will provide farmers tractors with ploughing instruments.

The state's Commissioner for Agriculture and Natural Resources, Dr. Martin Ijere, announced that the cost of hiring the tractors would be shared 50-50 by the state government and the farmers.

Continued from P 15

### FARMER OF THE MONTH

gradually enlarged to about 25 hectares to date. Encouraged by sales, Mr. Ajayi has acquired about a thousand hectares in Ogun State to set up yet another showpiece of a farm.

## Suggestions

Asked how he feels Government can help agriculture, Mr. Ajayi mused a while before giving his ideas as follows:-

(a) It augurs well for the nation that farming is now everybody's baby. The vocation is no longer down-trodden; as such, traders may find the business and as a result create artificial scarcity of goods. To combat such, government trading depots become necessary where needed produce will be available at stable prices.

(b) Storage and refrigeration facilities now become imperative. Farmers need loans for building stores and erecting silos for preserving excess products for future sales.

(c) Financial aid become important. Farmers have no collaterals for loans. As soon as a farmer's plan is feasible i.e. has enough land for tractor work, he should be advanced loans at low interest rates.

(d) Poultry processing and packing units at nodal centres to absorb broilers and culled birds from poultry farms should be established.

(e) Each state should have well-located plant hiring services near the farmers.

(f) Farm Products Standardisation Units are to enforce strict adherence to agricultural laws i.e. harvesting of fruits so that consumers can have good products and farmers can meet world market standards thereby ensuring the refund of loans. At the moment, many unripe fruits are usually brought to the market.

Mr. Ajayi is always on the farm with his workers. In fact it is usually difficult to find him in his office as he is always working with them.

The Farm's Contract Supply Service is aided by pick-up vans and a 24 hour telephone attendance on 31021 and 32526.

Mr. Ajayi and his family live on the farm—a very comfortable life replete with all that goes for soft-living—radio, television, refrigerator, a well furnished parlour and a charming wife.

Continued from P 25

## BABY RABBITS

The scientists at the Rowett took advantage of two characteristics of the wild rabbit when developing their rearing technique.

One is that, from the second day after giving birth, the doe suckles her young only once in 24 hours, usually early in the morning.

The other is that the young lie dormant until disturbed—in the wild, by the arrival of the doe to feed them.

To reduce losses from straying, chilling and unproductive disturbance by the doe, the nest boxes containing the litters were removed to an incubator where they were slotted like drawers, one above the other, and were kept warm and undisturbed all day and all night.

Each morning, the boxes were taken out in the batches of about six and presented in turn to their mothers in their cages.

By this time, the mammary glands of the does were full of milk and this (and the arrival of the nest full of active pups) seemed to stimulate them to jump into the nest, let down their milk and feed the litter immediately. In a few minutes, they jumped off again.

The boxes were then removed from the cages and each pup was examined to make sure that it had been fed.

If not, it was marked with a felt pen and fostered with another litter, thus receiving a second chance to feed.

The technique proved so successful, especially with batch mating and litters born within two or three days of each other, that the institute has now made an incubator big enough to accommodate 42 nest boxes, each made of transparent polycarbon to permit inspection without disturbance.

The temperature of this incubator is controlled thermostatically while a small fan is fitted for ventilation.

Another advantage of the incubator system is that it reduces heat requirement, which can be an important factor in times of high fuel costs, for it is only the new-born pups that require supplementary heat.

## COOPERATIVES

# NEW GOALS OF SOVIET CONSUMERS' COOPERATIVES

By Y. Zaostrovsky

*Until recently both Agriculture and Cooperatives have been Cinderella ventures in our midst; i.e. these pursuits have been despised. While some pretences have even featured in the establishment and running of Agriculture much as a show piece than a gainful venture, Cooperatives have always been the sick babies of their functionaries.*

*Farmstock has spread its tentacles as widely as possible to bring the experiences of Cooperatives, globewide, to all our readers. As more foreign Cooperation matters come in they will be published timely for comparative study by all with a view to improving ours generally. Following is a Comprehensive write-up on the aspirations, scope and modus-operandi of Cooperatives in the Soviet Union.*

The 25th CPSU Congress set important tasks in raising the Soviet people's living standards and cultural level. In accordance with its decisions, the consumer cooperatives are to play a big

*Continued on P 28*

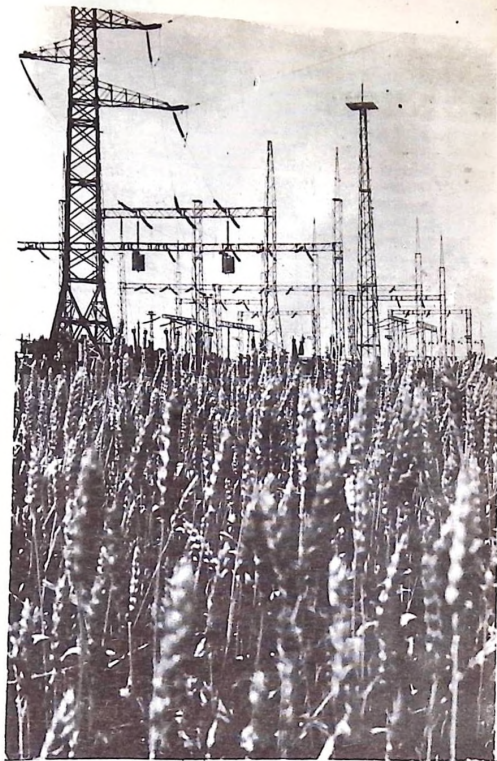
### GOVERNMENT WILL PROP COOPERATIVE

The Secretary of the Oyo State Government Mr C.S. Akande had disclosed that the Federal Military Government intended to involve the Cooperative Movement actively in all its future schemes with a view to reaching the masses. The fact was disclosed at a three day Conference of Registrars Cooperative Societies held recently in the University of Ibadan. He also added that the Nigerian Cooperative Movement was not intended to be a mere chapter of a foreign ideology or concept but a virile body contributing substantially to the people's progress.

In effect, the Registrars were implored to exploit all avenues to achieve the target of 25% coverage for nation-wide activities involving Cooperative expected by the FMG. As a guide, Mr. Akande listed what Government expected of the Cooperative namely:

- (a) Formation of more Cooperative Societies.
- (b) The exact role the Cooperatives want to or are playing in the OFN.
- (c) The best means of government help to Cooperatives
- (d) Constructive educational programme.
- (e) The relationship between the Cooperatives and the Nigerian National Supply Company.

Responding fittingly to the address, Mr. J.O. Taiwo the Federal Registrar of Cooperative Societies thanked the august guest speaker for his able address which would receive their attention forthwith.



### ELECTRICITY FOR THE VILLAGE

*One could hardly find in the Soviet Union a state—or collective-farm to which electric transmission lines have not been extended. During the 1971-1975 period alone about one million km of transmission lines have been erected in the countryside.*

*The Soviet state has undertaken to connect collective farms to the state power systems on easy terms—the price of one kWh is one kopeck (1.25 cents). Now 97 per cent of collective-and state farms have been connected to electric transmission lines.*

*Farm workers use electricity in the most labour-consuming processes, such as preparation of fodder, cleaning and loading of grain, milking of cows, repairing of agricultural machinery. The transition of agricultural production to an industrialised basis is taking place at a fast rate. Large-scale consumption of electricity collective farmers every day life enables them to enjoy all the benefits of city-life—many houses have radios, sets, TV-sets, refrigerators, and washing machines.*

*The growth of electricity consumption in agriculture of the USSR has become possible due to the country's increased power resources. In 1975, the Soviet Union produced about 1,000 billion KWh of electricity.*

*The picture shows a new subsystem in the collective farm "Bolshevik" Rostov Region (the South of Russia). Photo by Y. Komissarov. APN.*

Continued on P 27

role. Possessing a ramified network of shops, procurement and processing enterprises, as also a public catering system, Soviet cooperatives serve about half of the country's population, mainly in the rural areas.

*Operating in the conditions of a socialist system, the consumers' societies make a considerable contribution, with state assistance, to improving the life of the rural working people and eliminating the distinctions between the city and the countryside.*

*The Soviet villager has now the opportunity of buying at the cooperative shop all that the urban retail trade carries. Currently 40% of the washing machines, 52% of the bicycles, 90% of the motorcycles with sidecars and 50% of the passenger cars provided by the country's trade network are sold in villages.*

A considerable amount of ready-made clothes, knitgoods and leather footwear sold falls to the share of the cooperatives. In the current 10th Five-Year Plan period (1976-80) the Soviet cooperatives are to boost their sales by 27.29 per cent.

#### COOP Goods

A big place in the activities of the Soviet consumer cooperatives is their own production of foodstuffs and manufactured goods, which makes it possible to meet more fully the demands of the rural population. Their enterprises supply the population with bread, confectionery, sausage, beer, soft drinks, wine, clothes, footwear, tore equipment, furniture—in all, more than 50 different kinds of consumer goods.

In 1975 alone the cooperatives' enterprises produced more than 1,350 million tins of foods, and baked about 11 million tons of bread. The cooperatives also occupy themselves with the propagation and supply of fish, fur production, and gathering nature's gifts—mushrooms, berries, etc.

The programme for raising the welfare of the people adopted by the 25th CPSU Congress indicates the ways and means for the further development of cooperative production activities, for increasing the output of goods and improving their quality. Implementing the Congress decisions, the cooperatives have decided, for instance, to increase by 1980 the output of tinned goods by 23 per cent, culinary and confectionery items by 50 per cent.

One of the functions of Soviet consumer societies is the procurement of surplus farm products both from the collective farms and the population. Last year the cooperatives

bought up about 15 million tons of such products, which were put on sale at their shops in cities and villages, sent to public catering enterprises, and factories producing tinned goods, juices and other foods. In 1980 the volume of the procurements will increase by almost 20 per cent as against 1975.



Fruits already are becoming luxuries to many since their scarcity usually causes soaring prices out of the reach of many. In picture above, Mr. Ajayi, Director of Ajayi Farming Enterprises, Lagos State collects a ripe pineapple for a customer. "There is never enough," snapped the successful farmer. The Cooperatives can step in to improve conditions.

#### Retail Network

In a word, goods bearing the brand mark of cooperative enterprise will significantly increase, their assortment will broaden and the quality improve in the 10th Five-Year Plan period. To ensure the sale of these goods, the efficiency of the retail trade net-

work has to be raised. That is why Centrosoyuz (the leading organization of the Soviet consumers' cooperatives) has drawn up a programme for the further development of trade for 1976-1980.

Just as in the preceding years, a course will be followed for the stepped-up construction of big trade centres. Specialized shops for the sale of furniture, books, children's goods, as also stores for newlyweds, are to be opened in the countryside. This will make it more convenient to do shopping, providing faster service without any trouble in finding what the customer needs. The plans envisage opening up at least a thousand fish and over two thousand vegetable and fruit stores.

Catering enterprises not only selling food but also serving dinner and supper now form part of the rural landscape.

lised supply of semi-prepared food produced by large enterprises for rural dining rooms. Setting up such basic enterprises, the cooperatives thereby solve several problems simultaneously: the organisation of a steady supply of products for dining rooms in the close vicinity, improvement in the quality of the prepared food and, what is most important, providing better service for the rural people.

Centrosoyuz plans, in the main, to put all the public catering enterprises of the district centres on this supply method in the 10th Five-Year Plan period.

#### Field Work

During the spring sowing and harvesting periods tens of thousands of employees of the cooperative shops and public catering establishments leave

The cooperative dining rooms, cafes, restaurants and lunch bars already cater to more than 20 million people.

Care for the interests of the rural population is seen in the initiative shown by cooperative workers in organising the centra-

for the fields, tractor brigades and livestock farms. In 1976 the sowing campaign was served by 50,000 shops and dining rooms "on wheels."

At the request of peasants the goods ordered are delivered to their homes. In spring and

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summer fairs are held for the sale of farm implements, fertilizers, work clothes, shoes and other items of mass demand.

The Soviet cooperatives coordinate their activities with collective and state farms in improving rural life, the living conditions of the villagers. They jointly build trade and public catering establishments, and Houses of Culture. For instance, a bakery, a tinning plant, and a three-storey trade centre consisting of a department store, food shop and cafe, was built this way at the Ukrains Collective Farm in Khmelnytsky Region of the Ukraine. The construction of a fruit storage house and a refrigerator plant is nearing completion.

The tinning plant built there was led to the development of the farm's vegetable production, and to an increase in the output of food for the population. The plant's products are divided between the collective farm and the region's cooperative organization proportionally to the funds invested. And the enterprise is managed by a council consisting of representatives of both the farm and the cooperative.



Pawpaw is also a luxury, funny to say so. Cooperatives should step into fruit production too.

### Social Services

Besides trade shops the cooperatives put up medical establishments, schools, houses, sanatoriums and holiday homes, kindergartens, creches and stadiums. In the main this construction work is conducted on the funds provided by the cooperatives and mainly by their own building organizations.

The Soviet consumers societies readily share their experience in serving the population with their counterparts in other countries. Centrosoyuz is developing trade with cooperative organizations and firms of 39 countries. In 1975 alone the Centrosoyuz's trade with the developing countries rose by almost 9 per cent against 1974.

Guiding itself by the decisions of the 25th CPSU Congress, the Centrosoyuz Board has drawn up a programme for further cooperation with such organizations in other countries, including the young countries, in the 10th Five-Year Plan period. The export of Soviet consumers' cooperatives will, at the least, double during this period. This will serve to establish broader ties with the cooperative organizations of other countries in the interests of the working people, in the interests of peace, democracy and social progress.

## COOP SHOPS

The cost of the various development projects being carried out in this country today is largely derived from oil revenue. The ordinary man can only benefit from the oil boom if something is done to ease the high cost of living in the country.

The Price Control Board has at fixed prices. not succeeded in stabilising prices. If the government will establish such shops, they will be of the Federal Government to set great assistance to the poor. up Co-operative shops in the country where things are sold

Susana Giwa, KADUNA.



### MUTUAL INSPECTION AT THE ROYAL SHOW!

The examination seemed to be a two-way affair, when two members of a party of Nigerian agricultural officials stopped to inspect sheep during their tour of Britain's Royal Agricultural Show at Stoneleigh, in the midlands of England. They are Mr. John Antigha (left), an agricultural engineer, based in Calabar, Cross River State and Mr. John Ganna, engineering manager of the Agricultural Development Corporation, Ilorin, Kwara State.

The Nigerians spent, a great deal of time touring the show—Britain's premier agricultural event—where they looked at farm machinery, livestock, poultry and storage equipment and had discussions with manufacturers and experts in many areas of farming.

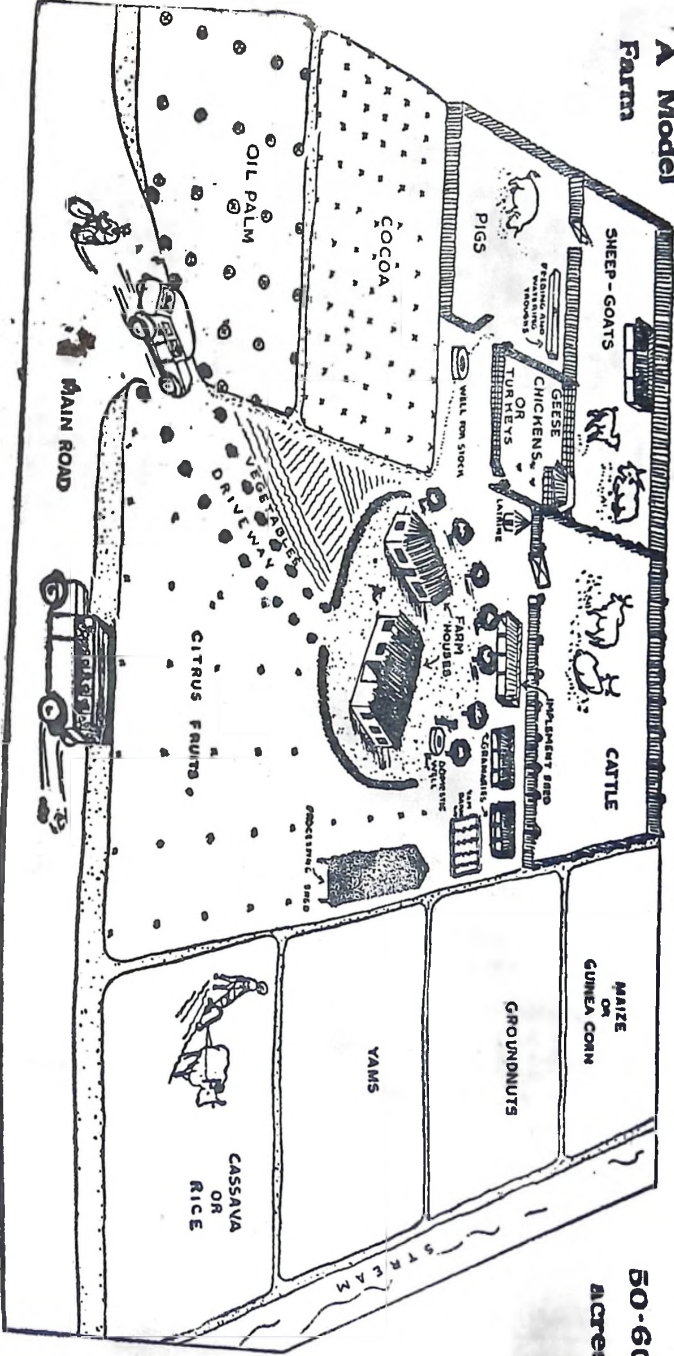
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