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FARMSTOCK

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news 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 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 Exe Committee of the Pool Region of the importance of this farm economy of the Pool Region a nation's food supplies.

Meat was still a luxury country and production me raised threefold to make meat able to all.

The Minister of Agricultur stock-breeding, Charles Ngouoto there were great possibilitie modern stock-breeding in C which had been making various e to increase and improve cattle st

The Odjiba sheep farm is pl to accomodate 15,000 to 20,000 of goats and sheep. They w bred for the meat market.

N2.5 INDUSTRY FOR KI

A N2.5 million mechanical pr sing industry is to be establish Ballah near Ilorin, Kwara State.

The Industry which is to go production about the end of this is being established by the I based private company – C Consolidated Advancement Corp (KCAC) in conjunction with an o seas partner – Messrs Newill Food Engineering Company.

Announcing this in Ilorin, the ject Director Mr. Olusegun Olajenc said that his company has se acquired an eight square mile farm both the cultivation of cassava the mechanisation of Gari in Ba village.

COMMUNITY RECONSTRUC

Construction work has begu the new primary school block Orimekpang, Boje Touring Area Ikom Division at an estimated cost N5,000.

Already, a sum of N1,038 has be raised by the community for the co struction work and the people h earmarked the sum of N542 for t construction of a community cassa farm be sited within the developm area and that work on the proje 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 pledge 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 TRADE FAIR WILL BE HELD IN ACCRA FROM FEBRUARY 1 - 15, 1976.

PLAN TO EXHIBIT NOW

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Trade Fair Post Office,
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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 illitrate 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 agric development, Colonial land played a vital role in the organ of agricultural production making it possible for peasa own and farm their own lands.

However, from 1940–1960 colonial government set up institutions which influenced quent agricultural developmen

The Nigerian institute for Oil Research and the West African Research Institute known as the Research Institute of Nigeria established during this period

The 1945 Colonial Develo and Welfare Act stated in its tives, the concentration on a li range of export crops.

Export crops having been linked with railways, expanded ly – cotton increased by 300 pe while rubber production incre twenty fold – and Cocoa with Gr nuts doubled.

Most of these increases caused by improved research me and use of chemicals.

Nigerian agriculture from 190 1960 could be regarded as a bou sector with the export sector ea most of our foreign exchange.

Gradually our foreign reserve being used to import food while agricultural sector experienced depression. No sufficient foodst were grown and the high rate of in tions made matters worse.

Nigerian who had taken agricult for granted owing to its past per mances and owing to the newly fou oil – wealth suddenly realised th they could not eat "oil" and as consequently faced with the scou of famine.

The 1970–74 allocated agricu N215 million to cover a number agricultural projects.

The need for an agricultural re lution finally reached the ears of th powers and in the 1975–80 plan sum of N1,400 million was allocat to the agricultural sector for var of projects.

In addition to this sum of N1 million allocated to agriculture, it be wise to further suggest that t government invest another N

million to make sure that the projects outlined during this plan period are not abandoned owing to inflation as

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. Ogbeha.

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 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 Irrua 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 Odiasa 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 have 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 cooperatives and Community Development Alhaji Muhammadu Gujbawu.

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. Chukwudotue.

The Resident also suggested that farmers should be given a substantial loan to enable them purchase modern impliments 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 enchance 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 it's kind in the country, will be sited at Oka waterside.

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 ger and progressive farmers under World Food Programme to enable t increase their present holdings output.

This was made known recently Udi by the agricultural officer charge of Udi division of the E Central State, Mr. F.I. Omali.

Mr. Omali spoke of the importa of palm oil in the overall econo development of the East Central St and called on farmers to direct effo towards establishing and expan their oil-palm plots to check the ra price of the commodity.

The objective of the program he added is to assist farmers re their plots established since the of the civil war and also to help t establish new ones for increa productivity.

NIGERIANS ON FISHERIES COURSE IN BRITAIN

Four Nigerians are attending course on fisheries manage probably the only one of its kind the world, which started in Septem at Grimsby Technical College.

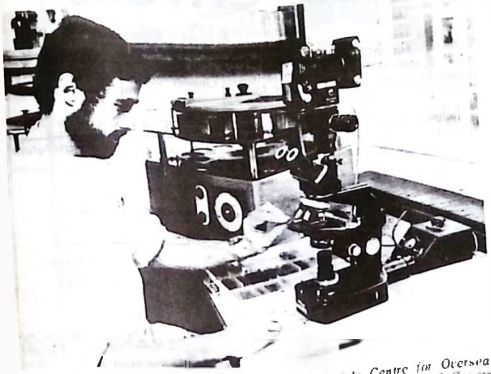
Mr. B. N. Obibuenyi, an administ tor from Enugu; Mr. O.O. Olatunde Supervisor of reservoirs and rivers Ibadan; Mr. A.A. Olaniawo, Fisher Officer in Iwo, and Mr. D.G. Nzi Fisheries Officer in Gambe are am 17 fisheries officers from develo countries being sponsores by Ministry of Overseas Development the year's course.

The course is for officials likely reach senior rank and covers a w range of subjects that Chief Fisher officers need today – from resou identification to the marketing a distribution of fish. It includes s subjects as practical fishing by great variety of techniques, boat a gear design and management, resou management, fisheries economics a the organisation of fisheries co-oper tives.

The participants will be visiti industrial and research establi ments throughout the United Kingdo

"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 managements 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 jof a combination of several factors:

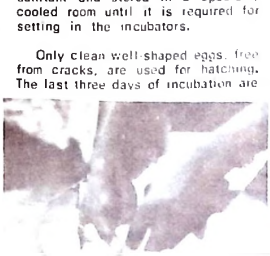
1. **Adaptability of the bird to farm conditions**
2. **Low feed consumption**
3. **High egg production**
4. **Large egg size**
5. **Good liveability**
6. **Good carcase weight at the end of lay**

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.

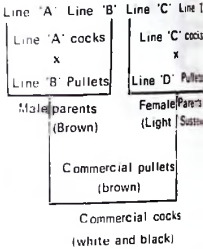
SERVICE AND ADVICE

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 ghdly put their knowledge and experience of the poultry industry at your disposal.

WHAT IS HYBRID?

A hybrid chick is the result of crossing two, three orjfour 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 several strains all into one bird. "hybrid vigour" to produce an outstanding commercial chick.

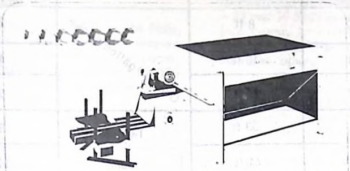
"Hybrid vigour" is the name given to the improvement in performance of a hybrid chick over that of its parents. It is responsible for an improvement of up to 50 eggs per bird over the parent strains. Selecting the best birds for use as grandparents for commercial birds is a complicated task.

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.

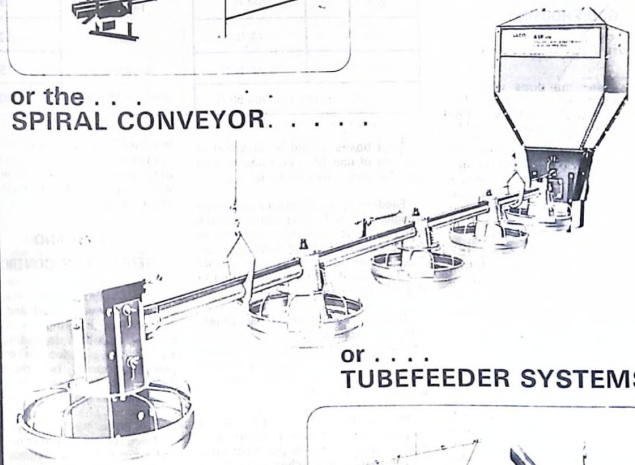
continue on page 12

LACO more than 20 years of experience in the design and manufacture of poultry-equipment.

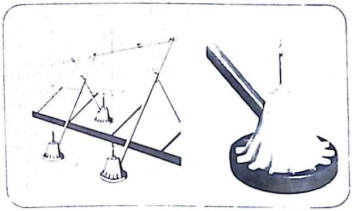


Whether it is for
CHAINFEEDER
INSTALLATIONS . .

or the . . . . . .
SPIRAL CONVEYOR. . . . .



or . . . .
TUBEFEEDER SYSTEMS



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continue on page 10

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 thet 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 fee 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	90
12 – 16	41 ft	round	120
16 – 20	50 ft	drinkers or	150
20 – weeks onwards	50 ft	one 4 ft. long	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 wodden 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 shoul be reared together in one cage. When birds are brooded in rearing cages, the wire floor should be covered hardboard or paper for the first until the birds are able to walk o wire. Sawdust, litter should be tered on top of the paper.

LIGHT AND TEMPERATURE CONTROL

Naturally-ventilated and natur lit poultry housing is very cheaper than that depending on ric power. Production per bir generally lower, but the return capital invested should be hi because of the lower cost of building.

There is no minimum size of and houses can be extended chea as the poultry unit grows. Poultry not need bright lights to lay es Indeed, too bright a light will ca feather pecking and cannibalism.

They should therefore be protec from direct sunlight. Birds give heat and breathe out foul air. ventilation system should remove t of these. Hot air rises, so an open at the top of the building is necessa to let it escape while cooler air com in through the sides.

Airflow round the birds themselv must be unobstructed, except in t case of young chicks which have be protected from draughts. T stair-step arrangement of cages gi the best air circulation. Natura ventilated poultry houses must not more than 30 ft wide.

Day-old chicks need warm dry and draughts-proof accommodation. Draughts can be prevented by using hardboard 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 beyong 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.

× × ×

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 differents 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 embroys, 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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Even banana skins may have their uses

by A. J. Arthur

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 steriods – but only methylated steriods, 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.

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.

The next stage is to look at s of these waxes for their phys properties and establish poss commercial applications. For d loping countries especially the wa open up an interesting prospect, they would compete with some of hydrocarbon waxes which all countr need for commercial applications.

In practice a great many hydroc bon waxes are obtained from oil T oil producing and refining countri are thus the main suppliers. For oth countries hydrocarbons mean an ex item on the import bill.

New Industries

Now, as a world oil shortage de lops and other sources begin to loo more attractive – and as prices beg to reflect that situation – the hum banana skin may get a new lease o life. Banana producing countries ca be able to set up small industries t make furniture polish or shoe polis from what would otherwise be a was byproduct. It would mean a saving precious foreign exchange.

The extraction process would itse require petrol, but nearly all t petrol would be recoverable by rec ling. The prospect is of a compreh sive banana industry produci ordinary bananas, dried banana banana flour, banana chips a commercial waxes.

Finally, the residue could still used as fertiliser – and there wou be positively nothing unsaleable le in the banana.

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.

Territorial waters and international law

by F. Kovalyov

The Third UN Conference on the Law of the Sea is regarded as being among the most important international forums over 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 Democratic 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 sovereignity 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 adop 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 eco political and strategic importa the international straits, a ke before the UN Conference on th of the Sea was to ensure freec navigation in such straits.

The width and regime of ter waters was a central item o agenda. Some of its aspects ne be dealt with additionally, partic in view of the tendencies which ged during the work of the Prepa Committee for the Third UN Confe on the Law of the Sea from 19 1973.

The question of the boundari territorial waters (territorial se part of the broader problem of borders, which, as is known, is a important matter in respect to t state relations.

A country's territorial waters part of the national property of coastal state. Recently a numbe countries have begun to declare size of their overall territory in cial handbooks as including the of their territorial waters.

The decisions to be adopted the UN Conference on the Law of Sea with respect to the boundaries territorial waters will, consequen affect the size of states, the volu of their marine resources, and t security interests.

But in defining the boundaries territorial waters it is not enough be guided only by these factors a proceed from the assumption that wider the territorial waters, the bet for the coastal states. It is a necessary to consider the interes of freedom of navigation and co aspects of the legitimate use of t open sea by all the countries of t world.

After all, the increase of the wi of territorial waters means the redu tion of the area of the open sea wh can be used by all nations and wh plays a considerable role in the li of each country and of the entire in national community.

50-YEAR STRUGGLE

For nearly 50 years, the USSR has been seeking to resolve the proble of territorial waters on the basis of comprehensive consideration of b the economic and security interests

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,

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The Poultry King of Opeyeka

Perhaps the main attraction to any business is the opportunity of making money readily. A few industries 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

Chief Emmanuel O. Ladebu - Adebaki

head and foot engrossed in the poultry industry to the tune of about N150,000 and a staff complement of ten each doing a full day's job s the chief keeps a 24 hour su llance so to say.

An initial batch of 300 day pullets - a backyard experime has become an octopoid busines eight years, what a record? The office is at 133, Isheri Road, I with the insignia - LADEBU POU FARMS LTD boldly written o sign-board at the gate.

Early life

Young Ladapo, his pet n began his elementary educatio Okenla C.M.S. School, Ifo, in 1 and entered the Baptist Boys H School in 1933 to come out flying colours in 193. and sk the Senior Cambridge School Cer cate at an age when holders of s a qualification could be counted Nigeria.

He then had a brief spell o years (1940 - 50) as a Civil Ser in the Meteorological Departmen a Meteorological Observer. "I w working in the close confines of a routine job while my inate wanted something more exac and equally rewarding', the c recalled; so he left the Civil Ser and joined the Leventis Grou Companies. His point of entry at Ibadan as a clerk.

Ten years in the Civil Ser where mediocrity is rewarding,

Miss Ladebu - Adebaki, already a College graduate, checks the incubator for temperature and humidity, to ensure a good hatch.

'Tatum birds compare well with any other breed'

by Abiọdun Ojugbelẹ
Managing Editor: Farmstock

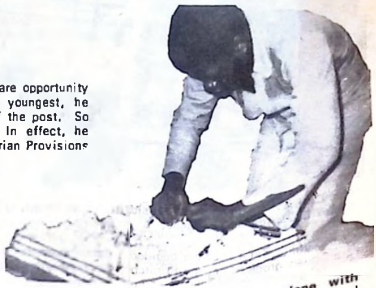
BU-ADEBAKI

ilge, Ifọ.

ot insufficient to change a good orker into an aloof and uninterested orker but Ladapo maintained his grounds and soon showed grit and diligence in his new working place - private trading firm like any other here privileges were few or unknown but where one had to work for seemingly unending hours to keep ye's post. A challenge came when ne Company wanted to launch a oneer Nigerian Managership Training Scheme.

Venturesome Ladapo, barely nine months in the company offered to ompete 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



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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 Honeggar birds, but is now on Tatum. His poultry business has gradaully 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 confi itself to hatching in order not compete with its customers in sale of table eggs and chic (broilers). But recent escalati prices of feed which have se many an egg producer packing h brought some hatchers includi Ladebu to undertaking the product of table eggs on contract.

This explains why many a turned back even when they see eg stacked high at the head off 'They are bought up'. The Ch told me: 'Tatum birds have go food conversion ratio, they a hardy, which means they are les susceptible to many diseases, hen mortality is low, they lay brown eg with thick shells and high hatchab lity; the eggs are less brittle an above all, the birds are quiet.

Their feed conversion is so goo that in seven weeks the chicks a ready for slaughter at an averag live-weight of 2 kilo and an averag dressed weight of 1.2 kilo. This i why I am still in business a pumping more cash into the whol enterprises', the Chief informed m

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

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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 extention 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 abovementioned provisions into the Geneva Conventions shows that these reflect generally binding rules of customary

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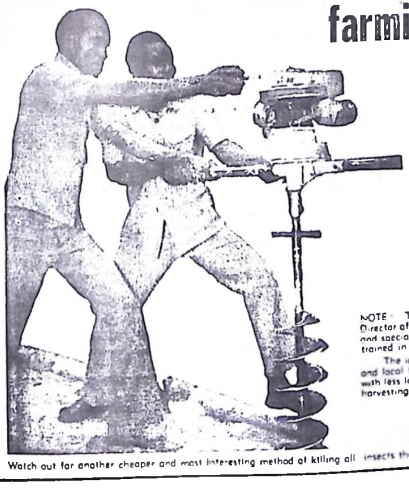

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TERRITORIAL WATERS AND INTERNATIONAL LAW

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 het 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 4–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 encr ment on the basic principles o law of the sea; the territorial-w regime and the basic freedoms o open sea–freedom of navig freedom of overflight, freedo fishing, freedom of laying cables pipelines, and freedom of resear

The legal regime of terri waters differs from the regime of and air territory of states in that accordance with international the right of so-called innocent pass across territorial waters is recogn for foreign merchant ships. This of regime for territorial waters conjunction with freedom of navig in international straits is necess for the unhindered development international shipping and for ensurance of uninterrupted sea in between all the countries of world.

It is not "granted" by an exp sion of will on the part of the coa state, but established in accord with international law and, con quently, cannot be unilaterally a lished.

Should the "territorial wate concept, which is firmly establis in practice and in international l be replaced by the "national se concept, the institution of "innoc passage" across territorial wat outside straits could then be scrapp In that event, foreign navigation "national seas" would be carried not in accordance with the princ of "innocent passage" recognised international law, but in accordan with the "right of transit" granted coastal states who would be in a po tion unilaterally to annul it or entir to regulate its use.

As for the idea of substituting t concept of "international mari space" for "open sea", the aims those who advocate this change r even more transparent: they want

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."

DEVELOPING COUNTRIES: PROBLEMS

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.

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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.

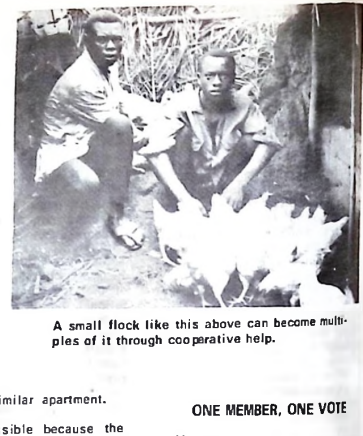
I was trained by the Baptists. They taught me to be self-reliant, hard-working and to wait for results. I do not smoke."

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.

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 intial 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.4(2), 4(3) and 5(3).

The Science syllabuses have been prepared on the assumption that the course will be based on practical work, and considerable waight 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 b- 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.

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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.

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 a 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 offr regular observation during growth is essential. At least two species of livestock, preferably one monogastic e.g. pigs, poultry, and one reminant 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 Agricul ural 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 a

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 specied 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 o 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 fungii, bacteria, nematodes and viruses and nutrient deficiences 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 lexotic and locall of each of the species.

2. Farm Animals: purposes of their production. Types and economic value of domestic animals locally proced

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 remidial 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 struction are not required.

APPENDIX TABLE

List of annual and perenial 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, luttuce, cabbage, cauliflower.

Group 4: Edible fruits and nuts: avocadeo pear; bananas, citrus fruits, guavas, mango, jackfuit, 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 cassave rosette and leaf-spot of groundnut, blast of rice and brown-rot of pineapple, nematodes of crops, parasistic 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, matchets, trowels, rakes, budding knives, shears, secateurs, chain measure, 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 Agriculture 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 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 Practicals 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 prifile-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 componenets 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 pests 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 colloidal systems, collids defined, properties state of colloidal system sol, gel.

(iii) Organic components of soil-organic material, substance and matter, humus.

I. 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.

(v) 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).

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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 typhoideus, Seteria italica, Elestine 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-Sphenostylists stenocarpa

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 domstic animals: cattle, goats, horses, pigs, sheep, rabbits, poultry and fish.

(b) Physiology of digestion, reproduction, lactation, milt 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, 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, imput 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 of 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
   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 grooming 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).