NIGERIA

The Insect Pests of Nigerian Crops and Stock 1946

Special Bulletin No. 4

AGRICULTURAL DEPARTMENT
NIGERIA

The Insect Pests of Nigerian Crops and Stock

F. D. GOLDING, M.A., F.R.E.S.

LAGOS
Printed by the Government
Printer — 1946

843/746/500

Price : 2s 6d

CONTENTS

Chapter		Page
I	Introduction	1
II	Notes on Major Pests of Crops and their Control	3
III	List of Crops	7
	I. Palms (Oil, Coconut and Date Palms)	7
	II. Cacao	7
	III. Kola	9
	IV. Coffee	9
	V. Shea Butter Tree	9
	VI. The Castor Plant	9
	VII. Root Crops (Yams, Sweet Potato and Cassava)	10
	VIII. Cereal Crops (Maize, Guinea Corn, Bulrush Millet, Rice and Finger Millet).	10
	IX. Leguminous Crops (Ground Nut, Pigeon Pea, Cowpea, Lima, Soya, Bengal, Lablab and Sword Beans and *Tephrosia candida*).	13
	X. Fibre Crops (Cotton, Hemp-leaved Hibiscus, *Urena lobata*, Jute and Long-fruited Jute).	16
	XI. Beniseed	19
	XII. Tobacco	19
	XIII. 'Egusi'	19
	XIV. Vegetables	19
	XV. Fruit Trees (Citrus, Mango, Guava, Sour-sop, Cashew, Pineapple and Banana).	22
	XVI. Stored Products	24
IV	List of Insect Pests and their Food-Plants	27
	I. Coleoptera	27
	II. Diptera	30
	III. Hymenoptera	30
	IV. Isoptera	30
	V. Lepidoptera	30
	VI. Orthoptera	34
	VII. Rhynchota	35
	VIII. Thysanoptera	38
V	List of Blood-Sucking Flies	39
VI	Bibliography: Literature dealing with the Crop Pests, Termites and Wild Silkworms of West Africa.	41

THE INSECT PESTS OF NIGERIAN CROPS AND STOCK

By F. D. GOLDING, M.A., F.R.E.S.

CHAPTER I

INTRODUCTION

This bulletin presents lists of the insect pests of crops and stock in Nigeria and a bibliography of the literature dealing with the crop pests, termites and wild silk moths of West Africa (Mauretania to the Belgian Congo). The main object of the bulletin is to collect under one cover data which should prove of interest to the writer's successors in the Nigerian Agricultural Department and to entomologists elsewhere. Mr G. S. Cotterell, who is shortly retiring after twenty-five years of entomological research in the Gold Coast, has written a handbook of the crop pests of that territory. His book contains about ninety excellent illustrations of major pests; descriptions of the insects; accounts of their life-histories and notes on methods of controlling them. As practically all the major pests of Nigeria also occur in the Gold Coast a similar handbook for this country would be redundant. When Mr Cotterell's book is published the value of this bulletin to laymen interested in agricultural entomology and to students will be greatly enhanced.

The vast majority of the crop pest records have been collected during the past thirty-five years by the following entomologists of the Agricultural Department: A. D. Peacock (1911-12); W. A. Lamborn (1913-14); A. W. J. Pomeroy (1914-1925), and the author (1922-46). With the exception of about twenty records of the author's, the list of blood-sucking flies has been compiled from data collected by medical officers; the majority were recorded by Dr Jas. J. Simpson, who visited Nigeria in 1910-11.

In Chapter III the pests are arranged under the crops they attack and the part of the plant damaged by each is recorded. In Chapter IV the insects are arranged alphabetically and opposite each is shown its known local food-plants, both crops and plants of no economic importance. The total number of species recorded is 357; they belong to the following eight Orders: Coleoptera (beetles) 92; Diptera (flies) 7; Hymenoptera (ants) 1; Isoptera (termites) 1; Lepidoptera (butterflies and moths) 131; Orthoptera (crickets and grasshoppers) 27; Rhynchota (plant bugs) 95, and Thysanoptera (thrips) 3. Of the twenty-three Orders of insects, fifteen are not represented in the list, whilst four Orders contain 96.6 per cent of the species which are pests of Nigerian crops. Of the 131 species of Lepidoptera mentioned, the adults of twenty-four are fruitpiercers and the larvae or

caterpillars of 106 are the injurious stage; in the remaining species, *Anomis leona*, Schaus., the adult moth pierces fruit and the larvae attack the leaves and pods of both Cacao and Kola. All the plant bugs are sucking insects and the major pests among them owe their importance to the fact that they either carry virus or fungoid diseases from plant to plant or inject toxic saliva into the host plant.

Fortunately for the Nigerian farmer, many of the insects mentioned are of only minor importance; the major pests are discussed briefly in Chapter II. Chemical methods of control are, generally speaking, impracticable under present conditions in Nigeria, except: (*a*) in locust control, in which the work is carried out on a large scale under European supervision (the farmer is not required either to pay for the poison or to apply it); (*b*) on departmental stations; (*c*) on estates and, possibly, (*d*) in special cases, where a group of farmers are members of a co-operative society and can therefore afford to buy the necessary chemicals and apparatus on a communal basis. We have to rely chiefly on agricultural methods of control, for example, early or late planting to avoid the period when the pest is abundant, rotation of crops, good cultivation to increase the vigour of the crop, clean weeding and the breeding of strains resistant to pests; simple mechanical methods, such as hand-picking of the pest and biological control (the introduction of parasites or predators).

The bibliography in Chapter VI contains 183 references, of which forty-two are from the Belgian Congo; ninety from British West Africa, and forty-eight from French Africa (A.O.F. and A.E.F.)

The author wishes to express his gratitude to the Director and staff of the Imperial Institute of Entomology and to the specialists of the Department of Entomology in the British Museum (Natural History) for identifying the insects he has sent home during the last 24 years.

CHAPTER II

NOTES ON MAJOR PESTS OF CROPS AND THEIR CONTROL

I. Locusts.—The African Migratory Locust (*Locusta migratoria migratorioides*, R. & F.), is the only species affecting the whole of Nigeria. During the recent swarming period of *Locusta* adult swarms were always present in some part of this country from December, 1929, until January, 1940. The only known outbreak area of this locust is in the Middle Niger region of French Soudan and the French authorities maintain a permanent organisation there which keeps a continual watch for gregarious tendencies amongst the solitary phase population. Small bands of hoppers were discovered and destroyed in March of 1942, 1943 and 1944 and it is possible that this control work prevented another general outbreak of *Locusta* in that part of Africa lying between 17 degrees N. and 20 degrees S. In Nigeria, during periods of quiescence the solitary phase of *Locusta* is found only in the vicinity of Lake Chad; a few hopper bands were present in the autumn of 1942, but it seems improbable that the Chad region is an outbreak area.

Swarms of the Desert Locust (*Schistocerca gregaria*, Forsk.) frequently pass eastwards across the most northerly part of Nigeria between April and late June; the only records of breeding occurring in this country were in the autumn of 1943 in the extreme north-east corner of Bornu and on the Sokoto-French Niger boundary. During periods of quiescence the solitary phase does not occur in Nigeria.

The Red Locust (*Nomadacris septemfasciata*, Serv.) is found only in the Chad area, swarms were present in 1930, 1931 and 1932. The swarms did not appear to be of the true gregarious phase and it is doubtful if the Chad region is an outbreak area of this species. The solitary phase is always present.

The Tree Locust (*Anacridium moestum melanorhodon*, Walk.) occasionally swarms in the most northerly parts of Nigeria; the swarms fly at night and are seen between January and April.

Once an outbreak has started and breeding has begun the hoppers are destroyed by means of poisoned baits consisting of a base, such as guinea-corn bran, treated with sodium arsenite. The new insecticide Gammexane has been found (in other countries) to be very effective as a locust poison and it is proposed to replace sodium arsenite, which is extremely toxic to man and stock, by Gammexane in future campaigns in Nigeria. Some 60 to 70 tons sodium arsenite were used in the campaigns of 1930 to 1939.

II. The Oil Palm.—There are no major pests of the Oil Palm, but the weevil, *Temnoschoita quadripustulata*, F., has killed many newly-transplanted seedlings in recent years at the Oil Palm Research Station near Benin.

III. Cacao.—The most important pest of Cacao is the Capsid bug, *Sahlbergella singularis*, Hagl., which destroys the young shoots and chupons. The staff of the West African Cacao Research Institute, at Tafo in the Gold Coast, are

endeavouring to find some practical means of controlling this pest. Spraying with a nicotine preparation is effective, but it would be an immense task to utilise this method throughout the affected parts of the Cacao belts of the Gold Coast and Nigeria. In this country, *Sahlbergella* is more abundant in those parts of the belt with a rainfall of over sixty inches *per annum* than in the Ibadan area, where the annual precipitation is under fifty inches.

A closely-related Capsid, *Distantiella theobroma*, Dist., does much damage to newly-established Cacao trees.

IV. Kola.—The principal pest of Kola is the small weevil, *Balanogastris kolae*, Desbr., the larvae of which burrow into the nuts, both in field and store, and render them unsaleable. Infestation can be reduced considerably by destroying fallen fruits that have matured out of season, by harvesting only sound pods and by breaking open the picked pods well away from the trees.

Another important pest of Kola is the larva of a Longicorn beetle (probably *Phosphorus sp.*) which tunnels into the branches of the trees and destroys them. The only feasible control is to cut off infested branches directly the damage is noticed and then burn them.

V. Yams.—In some years the large Dynastid beetle, *Heteroligus claudius*, Klug., does much damage to Yam tubers in parts of the Benue, Onitsha and Benin Provinces. Late planting to avoid the migration period of the adult beetles is effective in reducing damage, but has the disadvantage of reducing yields in some years.

VI. Cassava.—The only serious pathogen of this crop is the virus disease, Mosaic, which reduces the yield by about 30 per cent. The virus is carried from plant to plant by the whitefly, *Bemisia nigeriensis*, Corb. The Botanical Section of the Nigerian Agricultural Department have bred out strains of Cassava with a high degree of resistance to Mosaic.

VII. Cereal Crops.—Maize, Guinea Corn and Bulrush Millet are all subject to the attacks of the stem-boring larvae of several species of Noctuid and Pyralid moths, of which *Busseola fusca*, Full., is the most important. In the Ibadan area damage is particularly severe when Late Maize is grown after Early Maize. Infested plants are easily recognisable and should be uprooted and burnt directly they are noticed. When feasible, plants should be uprooted and burnt after harvesting as the old stalks contain resting larvæ and pupæ.

Cereal crops are also subject to attack by the Noctuid larvæ known as Army Worms, of which the most important local species is *Laphygma exempta*, Wlk. The moths migrate in swarms at night and the females deposit their eggs on grass. On hatching the larvæ migrate and if they encounter a field of maize they destroy the bulk of the plants in a remarkably short time. The only feasible control method for the local farmer is to dig a trench between his cornfield and the advancing caterpillars; holes should be made at intervals along the bottom of the trench and, when the larvæ fall into them, they can be destroyed by driving a wooden stake into the holes. A South African entomologist has recently discovered that there are solitary and gregarious phases amongst the Army Worms comparable to those of locusts. Army Worms occur in many parts of Nigeria, usually in May and occasionally in September.

The Coreid bug, *Leptocorisa apicalis*, Westw., caused considerable damage to the rice crop in parts of Epe Division one season by attacking the grains when in the milky stage. This bug also feeds on grass seeds and it is important to keep rice fields free from flowering grasses. The grass surrounding the fields should be cut down at least a month before the rice comes into flower. It is desirable that all the rice in any one area should come into ear at about the same time. Handpicking of the bugs is beneficial if carried out at the beginning of flowering; the insects can be dropped into tins containing water and a little kerosene.

VIII. Ground Nut.—The most important pest of this crop is the aphid. *Aphis laburni*, Kalt., which carries the virus disease Rosette from plant to plant. Early-sown ground nuts suffer far less from Rosette than those planted later in the season.

IX. Cotton.—During 1944 the notorious Pink Bollworm, *Platyedra gossypiella*, Saund., was discovered for the first time in West Africa. This insect is a major pest of the crop in nearly all the cotton-growing countries of the world; the larva has a resting stage inside harvested seed and is thus carried from country to country. It is now the most important pest of the cotton crop in the south-western area (Oyo and Abeokuta Provinces); but is still rare in the northern American cotton belt. Infestation can be reduced by uprooting and burning the plants after harvest; the fields should be cleared of all forms of debris (derived from the plants) which should then be burnt. Many farmers plant yams after cotton and leave the old plants in the land to act as yam stakes; for this reason it is difficult to persuade the farmers to uproot their cotton plants after harvest. The resting larvæ in cottonseed in the ginneries could be destroyed by means of heating machines, but it does not seem profitable to import these expensive machines unless (*a*) the farmers uproot and burn their plants and (*b*) the local spinners kill the resting larvæ (by heat) in the seed in their houses.

There are three other important species of bollworms, namely, the Red Bollworm (*Diparopsis castanea*, Hmps.) and the Spiny Bollworms (*Earias biplaga*, Walk. and *E. insulana*, Boisd.). The Red Bollworm passes the ' dead season ', that is to say, the period when no cotton is being grown, in the pupal stage in the soil; thorough cultivation of the soil after harvest exposes the pupæ to the sun and to their natural enemies: birds, mice, etc. The most important general control measure against cotton pests is the ' dead season ', which should be as long as possible.

The Cotton Stainer, *Dysdercus superstitiosus*, F. (Fam.: Pyrrhocoridæ), pierces the green bolls and introduces fungi (*Nematospora spp.*) which cause staining and rot. These bugs are the main factor inhibiting the growth of American cotton in areas south of the Niger. In the more northerly areas the dry atmospheric conditions following the onset of the ' harmattan ' in October rid the fields of stainers at a time when the crop is setting.

The Jassid bug, *Empoasca facialis*, Jac., is an important pest of cotton all over the country, but resistant strains of both American and indigenous cottons have been bred by the Botanical Sections at Samaru and Ibadan. In the Southern Provinces the virus disease, Leaf Curl, which is carried by the whitefly, *Bemisia goldingi*, Corb., used to cause a considerable diminution in yield; but the improved Ishan cotton, bred by the Botanical Section, is resistant, probably because its leaves are pubescent and therefore repellent to the insect vector.

X. *Citrus.*—About eighty species of Noctuid moths pierce the fruits of Citrus, principally Sweet Orange, Grapefruit and Tangerine, in West Africa. Attack takes place during the night and the punctures made by the moths' proboscides permit the entrance of fungi and bacteria into the fruit, which then fall off the trees and are unfit for eating. In Nigeria the most important species are *Othreis fullonia*, Cl., *Achæa lienardi*, Boisd. and *A. faber*, Holl.; nearly all the damage occurs to the mid-crop between April and July, whilst the main crop, which begins to ripen in the autumn, is almost immune from attack. The only feasible method of control is prompt harvesting of the crop.

XI. *Stored Products.*—The most serious pest of stored Grain is the Rice Weevil, *Calandra oryzæ*, L., which is responsible for heavy losses, particularly of maize. Farmers often tie up their maize cobs over fires in their houses. On Departmental farms the grain is fumigated with Carbon Bisulphide, but owing to the inflammability of this chemical the method is not suitable for general use. In addition, in the Southern Provinces it is impossible to dry the early maize crop sufficiently for it to be stored in insectproof containers after fumigation. It is hoped that the new insecticide, Gammexane, will solve the problem of early maize storage; a small quantity of Gammexane mixed with the grain should prevent damage and it should be possible to keep the maize on the store floor, where it can be turned periodically to prevent damage through 'sweating'.

In Adamawa Province and parts of Bauchi the Bruchid beetle, *Pachymerus longus*, Pic., attacks undecorticated groundnuts in the farmers' mud stores (rumbus). This pest can be controlled by thoroughly cleaning out the rumbus a month before harvesting begins and burning dry grass in them to destroy any beetles that may remain. The newly-harvested nuts should be mixed with dry sand or ashes and covered with a four-inch layer of whichever material is used.

When Cocoa beans are stored for long periods in this country they are liable to serious insect attack so it is desirable to export the beans as soon as possible. The principal pests are the Pyralid moth, *Ephestia cautella*, Wlk. (known as the Cocoa Moth in West Africa); the Anthribid beetle, *Araecerus fasciculatus*, de Geer (known as the Cocoa Weevil) and the Tobacco Beetle, *Lasioderma serricorne*, F. The moths can be controlled by good ventilation and scrupulous cleanliness in the store and the use of 'ate' strands (for trapping the moths). Cocoa beans containing less than nine per cent moisture content are not liable to attack by the Cocoa Weevil. The Tobacco Beetle will attack dry beans and is difficult to control, but fly-papers hung in windows help to reduce its numbers. The new insecticides Gammexane and D.D.T. will probably prove of use against the pests of Cocoa stores.

LIST OF CROPS

I.—PALMS.

(*a*) The Oil Palm, *Elaeis guineensis*, Jacq. (A. and L.—adults and larvae).

Leaves.

Order	*Family*	*Name of Pest*	
COLEOPTERA.	Cetoniidae.	*Platygenia barbata*, Afzel.	Larvae.
COLEOPTERA.	Curculionidae	*Temnoschoita quadripustulata*, F.	,,
COLEOPTERA.	Hispidae.	*Coelaenomenodera elaeidis*, Maul.	,,
LEPIDOPTERA.	Hesperiidae.	*Pteiroteinon laufella*, Hew.	,,
LEPIDOPTERA.	Pyralidae.	*Pimelephila ghesquierei*, Tams.	,,
ORTHOPTERA.	Acrididae.	*Locusta migratoria migratorioides*, R. and F.	Adults.
RHYNCHOTA.	Coccidae.	*Aspidiotus destructor*, Sign.	A. and L.

Crown.

COLEOPTERA.	Dynastidae.	*Oryctes erebus*, Burm.	Adults.
COLEOPTERA	Dynastidae.	*O. owariensis*, P. de B.	Adults.

Trunk.

COLEOPTERA.	Curculionidae.	*Rhynchophorus phoenicis*, F.	Larvae.

Stalk of female inflorescence.

DIPTERA.	Stratiomyidae.	*Hermetia pennicornis*, Bezzi.	,,

Nuts.

COLEOPTERA.	Bruchidae.	*Pachymerus lacerdae*, Chev.	,,
COLEOPTERA.	Scolytidae.	*Coccotrypes pygmaeus*, Eich.	,,
LEPIDOPTERA.	Pyralidae.	*Corcyra cephalonica*, Staint.	,,

(*b*) The Coconut Palm, *Cocos nucifera*, Linn.

Leaves.

RHYNCHOTA.	Coccidae.	*Aspidiotus destructor*, Sign.	A. and L.

Trunk.

COLEOPTERA.	Curculionidae.	*Rhynchophorus phoenicis*, F.	Larvae.

(*c*) The Date Palm, *Phoenix dactylifera*, Linn.

Crown.

COLEOPTERA.	Dynastidae.	*Oryctes monoceros*, Oliv	Adults.

II.—CACAO, *Theobroma cacao*, L.

Leaves.

COLEOPTERA.	Melolonthidae.	*Trochalus carinatus*, Schönh.	Adults.
COLEOPTERA.	Rutelidae.	*Adoretus umbrosus*, F.	Adults.
LEPIDOPTERA.	Arctiidae.	*Diacrisia curvilinea*, Walk.	Larvae.
,,	Arctiidae.	*D. maculosa*, Cram.	,,
,,	Eupterotidae.	*Phiala hologramma*, Aur.	,,
,,	Geometridae.	*Alcis divisaria*, Walk.	,,
,,	Hesperiidae.	*Rhopalocampta forestan*, Cram.	,,
,,	Limacodidae.	*Parasa viridissima*, Holl.	,,

LEPIDOPTERA.	Noctuidae.	*Anomis leona*, Schaus.	Larvae.
,,	,,	*Earias biplaga*, Walk.	,,
,,	,,	*Lophacrama phaenicochlora*, Hmps.	,,
,,	,,	*Plusia acuta*, Walk.	,,
,,	,,	*Prodenia litura*, F.	,,
,,	Nymphalidae.	*Precis pelarga*, F.	,,
,,	Psychidae.	*Metisa sierricola*, White.	,,
,,	Pyralidae.	*Sylepta retractalis*, Hmps.	,,
ORTHOPTERA.	Acrididae.	*Catantops simplex*, Uv.	Adults.
,,	,,	*C. spissus*, Wlk.	Larvae.
,,	,,	*Zonocerus variegatus*, L.	A. and L.
RHYNCHOTA.	Coreidae.	*Cletomorpha lancigera*, F.	Adults.
THYSANOPTERA.	Thripidae.	*Machatothrips braueri*, Karny, var. *buffai*, Karny.	A and L.
THYSANOPTERA.	Thripidae.	*Selenothrips rubrocinctus*, Giard.	A. and L.

Shoots.

COLEOPTERA.	Curculionidae.	*Isaniris thomsoni*, Fst.	Adults.
LEPIDOPTERA.	Noctuidae.	*Characoma stictigrapta*, Hmps.	Larvae (borers).
LEPIDOPTERA.	Noctuidae.	*Earias biplaga*, Walk.	Larvae (borers).
RHYNCHOTA.	Capsidae.	*Distantiella theobroma*, Dist.	A. and L.
,,	Capsidae.	*Helopeltis bergrothi*, Reut.	,,
,,	Capsidae.	*Sahlbergella singularis*, Hagl.	,,
,,	Coccidae.	*Dactylopius longispinus*, Targ.	,,
,,	Coccidae.	*Pseudococcus virgatus*, var. *madagascariensis*, Newst.	,,
,,	Coccidae.	*Stictococcus dimorphus*, Newst.	,,
,,	Coccidae.	*S. sjöstedti*, Newst.	,,
,,	Pentatomidae.	*Atelocera raptoria*, Germ.	,,
,,	Psyllidae.	*Mesohomotoma tessmanni*, Aulm., var.	,,
,,	Ricaniidae.	*Pochazia fasciata*, F.	Adults.

Stem-borers (*—of seedling plants).

COLEOPTERA.	Anthribidae.	**Phloeobius catenatus insignis*, Jord.	Larvae.
,,	Bostrychidae.	*Apate monacha*, F.	Adults.
,,	Scolytidae.	**Coccotrypes pygmaeus*, Eich.	Larvae.
LEPIDOPTERA.	Megalopygidae.	*Eulophonotus myrmeleon*, Feld.	,,

Pods.

COLEOPTERA.	Anthribidae.	*Araecerus fasciculatus*, de Geer.	,,
DIPTERA.	Trypetidae.	*Pardalaspis punctata*, Wied.	,,
LEPIDOPTERA.	Noctuidae.	*Anomis leona*, Schaus.	,,
LEPIDOPTERA.	Noctuidae.	*Characoma stictigrapta*, Hmps.	,,
LEPIDOPTERA.	Pyralidae.	*Mussidia nigrinervella*, Rag.	,,
RHYNCHOTA.	Capsidae.	*Distantiella theobroma*, Dist.	A. and L.
,,	Capsidae.	*Helopeltis bergrothi*, Reut.	,,
,,	Capsidae.	*H. westwoodi*, White.	,,
,,	Capsidae.	*Sahlbergella singularis*, Hagl.	,,
,,	Coccidae.	*Pseudococcus njalensis*, Laing.	,,
,,	Coccidae.	*Stictococcus dimorphus*, Newst.	,,
,,	Coreidae.	*Acanthocoris dentatus*, Hagl.	Adults.
,,	Pentatomidae.	*Bathycoelia thalassina*, P.B.	,,
,,	Pentatomidae.	*Halyomorpha reflexa*, Sign.	,,
,,	Pentatomidae.	*Piezosternum fallax*, F.	,,

III.—KOLA, *Cola nitida*, A. Chev. and *C. acuminata*, Schott and Endl.

Leaves. (*—attacking *C. acuminata*).

COLEOPTERA.	Rutelidae.	*Adoretus umbrosus*, F.	Adults.
LEPIDOPTERA.	Limacodidae.	*Parasa viridissima*, Holl.	Larvae.
,,	Lymantriidae.	**Dasychira proleprota*, Hmps.	,,
,,	Noctuidae.	*Anomis leona*, Schaus.	,,
,,	Psychidae.	*Metisa sierricola*, White.	,,
,,	Pyralidae.	*Sylepta derogata*, F.	,,
,,	Pyralidae.	*S. polycymalis*, Hmps.	,,
,,	Pyralidae.	*S. semilugens*, Hmps.	,,
,,	Sphingidae.	*Polyptychus carteri*, Butl.	,,
,,	Sphingidae.	*P. poliades*, Jord.	,,
ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	A. and L.

Shoots.

RHYNCHOTA.	Delphacidae.	*Pundaluoya simplicia*, Dist	Adults.
RHYNCHOTA.	Psyllidae.	*Mesohomotoma tessmanni*, Aulm., var.	A. and L.

Stems.

COLEOPTERA.	Lamiidae.	*?Phosphorus sp.*	Larvae.

Pods.

COLEOPTERA.	Curculionidae.	*Balanogastris kolae*, Desbr.	A. and L.
COLEOPTERA.	Curculionidae.	*Paremydica insperata*, Fst.	A. and L.
DIPTERA.	Trypetidae.	*Ceratitis colae*, Silv.	Larvae.
LEPIDOPTERA.	Eucosmidae.	*Argyroploce leucotreta*, Meyr.	,,
LEPIDOPTERA.	Noctuidae.	*Anomis leona*, Schaus.	,,
LEPIDOPTERA.	Noctuidae.	*Characoma stictigrapta*, Hmps.	,,

IV.—COFFEE, *Coffea spp.*

Leaves.

COLEOPTERA.	Galerucidae.	*Ootheca mutabilis*, Sahlb.	Adults.
LEPIDOPTERA.	Drepanidae.	*Epicampoptera glauca*, Hmps.	Larvae.
LEPIDOPTERA.	Gracilariidae.	*Acrocercops chalybophanes*, Meyr. (miners)	Larvae.
LEPIDOPTERA.	Limacodidae.	*Thosea pepon*, Karsch.	Larvae.

Shoots.

RHYNCHOTA.	Dictyopharidae.	*Dictyophara serene*, Stål.	Adults.

Berries.

COLEOPTERA.	Scolytidae.	*Cryphalus hampei*, Ferr.	A. and L.
DIPTERA.	Trypetidae.	*Ceratitis nigerrima*, Bezzi.	Larvae.
LEPIDOPTERA.	Pyralidae.	*Thliptoceras octoguttale*, Feld.	Larvae.
RHYNCHOTA.	Pentatomidae.	*Antestia lineaticollis*, St.	A. and L.

V.—SHEA BUTTER TREE, *Butyrospermum Parkii*, Kotschy.

Leaves.

LEPIDOPTERA.	Lymantriidae.	*Dasychira carpenteri*, B. Bkr.	Larvae.
LEPIDOPTERA.	Lymantriidae.	*D. proleprota*, Hmps.	Larvae.
LEPIDOPTERA.	Saturniidae.	*Cirina butyrospermi*, Vuillet.	Larvae.

VI.—THE CASTOR PLANT, *Ricinus communis*, Linn.

Leaves.

COLEOPTERA.	Lagriidae.	*Lagria viridipennis*, F.	Adults.
LEPIDOPTERA.	Lasiocampidae.	*Leipox is rufobrunnea*, Strand	Larvae.
RHYNCHOTA.	Capsidae.	*Helopeltis sang ineus*, Popp.	Adults.

Petioles and green fruits.

RHYNCHOTA.	Pentatomidae.	*Caura pugillator*, F.	Adults.

Stems.

RHYNCHOTA.	Cercopidae.	*Ptyelus grossus*, F.	A. and L.

VII.—ROOT CROPS.

(*a*) Yams, *Dioscorea spp.*

Leaves.

COLEOPTERA.	Crioceridae.	*Crioceris livida*, Dalm.	A. and L.
COLEOPTERA.	Lagriidae.	*Lagria villosa*, F.	Adults.
COLEOPTERA.	Lagriidae.	*L. viridipennis*, F.	Adults.
LEPIDOPTERA.	Arctiidae.	*Diacrisia lutescens*, Wlk.	Larvae.
,,	Hesperiidae.	*Tagiades flesus*, F.	,,
,,	Noctuidae.	*Metagarista maenas*, H.-Sch.	,,
,,	Noctuidae.	*M. triphaenoides*, Wlk.	,,
ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	A. and L.
RHYNCHOTA.	Coccidae.	*Aspidiotus destructor*, Sign.	A. and L.

Young shoots.

COLEOPTERA.	Crioceridae.	*Crioceris livida*, Dalm.	A. and L.

Stems.

RHYNCHOTA.	Cercopidae.	*Ptyelus grossus*, F.	A. and L.

Tubers and seed yams.

COLEOPTERA.	Dynastidae.	*Heteroligus appius*, Burm.	Adults.
COLEOPTERA.	Dynastidae.	*H. claudius*, Klug.	Adults.

(*b*) Sweet Potato, *Ipomoea Batatas*, Lam.

Leaves.

LEPIDOPTERA.	Sphingidae.	*Herse convolvuli*, L.	Larvae.
RHYNCHOTA.	Capsidae.	*Halticus tibialis*, Reut.	Adults.

Tubers.

COLEOPTERA.	Curculionidae.	*Cylas brunneus*, F.	A. and L.
COLEOPTERA.	Curculionidae.	*C. puncticollis*, Boh.	A. and L.

(*c*) Cassava, *Manihot utilissima*, Pohl.

Leaves. (*—vector of virus disease, Cassava Mosaic).

LEPIDOPTERA.	Saturniidae.	*Bunaea alcinoë*, Cram.	Larvae.
ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	A. and L.
RHYNCHOTA.	Aleurodidae.	**Bemisia nigeriensis*, Corb.	A. and L.

VIII.—CEREAL CROPS.

(*a*) Maize, *Zea Mays*, Linn.

Leaves. (*—Army Worms).

COLEOPTERA.	Coccinellidae.	*Epilachna similis*, Thnbg., var. *assimilis*, Muls.	Adults.
COLEOPTERA.	Hispidae.	*Hispa spinulosa*, Schönh.	Adults.
COLEOPTERA.	Lagriidae.	*Lagria villosa*, F.	Adults.
COLEOPTERA.	Lagriidae.	*L. viridipennis*, F.	Adults.
COLEOPTERA.	Melolonthidae.	*Pseudotrochalus concolor*, Kolbe.	Adults.
LEPIDOPTERA.	Arctiidae.	*Diacrisia lutescens*, Wlk.	Larvae.
,,	Noctuidae.	*Cirphis loreyi*, Dup.	,,

LEPIDOPTERA.	Noctuidae	**Laphygma exempta*, Wlk.	Larvae.
,,	,,	**L. frugiperda*, S. & A.	,,
,,	,,	*Phytometra acuta*, Walk.	,,
,,	,,	*Prodenia litura*, F.	,,
,,	,,	**Spodoptera mauritia*, Boisd.	,,
ORTHOPTERA.	Acrididae.	*Acrida sulphuripennis*, St.	Adults.
,,	,,	*Locusta m. migratorioides*, R. and F.	A. and L.
,,	,,	*Morphacris fasciata*, Thnbg., *ab. sulcata*, Thnbg.	A. and L.
,,	,,	*Nomadacris septemfasciata*, Serv.	A. and L.
,,	,,	*Oxya hyla minor*, S jöst.	Adults.
,,	,,	*Spathosternum pygmaeum*, Karsch.	Adults.
,,	,,	*Zonocerus variegatus*, L.	Larvae.
RHYNCHOTA.	Delphacidae.	*Sogata furcifera*, Horv.	Adults.
,,	Jassidae.	*Cicadulina sp.*, nr. *arachidis*, China.	,,
,,	Jassidae.	*Cicadulina sp.*, nr. *storeyi*, China.	,,
,,	Plataspidae.	*Coptosoma nubila*, Germ.	,,
Stem-borers.			
LEPIDOPTERA.	Noctuidae.	*Busseola fusca*, Full.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Sesamia calamistis*, Hmps.	Larvae.
LEPIDOPTERA.	Pyralidae.	*Eldana saccharina*, Walk.	Larvae.
Cobs.			
COLEOPTERA.	Curculionidae.	*Calandra oryzae*, L.	A. and L.
COLEOPTERA.	Tenebrionidae.	*Tribolium castaneum*, Herbst.	Adults.
LEPIDOPTERA.	Eucosmidae.	*Argyroploce leucotreta*, Meyr.	Larvae.
,,	Noctuidae.	*Sesamia calamistis*, Hmps.	,,
,,	Pyralidae.	*Eldana saccharina*, Walk.	,,
,,	Pyralidae.	*Mussidia nigrinervella*, Rag.	,,
RHYNCHOTA.	Pentatomidae.	*Halydicoris scoruba*, Dall.	Adults.
RHYNCHOTA.	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	Adults.
(*b*) Guinea Corn, *Sorghum spp.*			
Leaves.			
LEPIDOPTERA.	Noctuidae.	*Cirphis loreyi*, Dup.	Larvae.
ORTHOPTERA.	Acrididae.	*Acanthacris ruficornis citrina*, Serv.	Larvae.
ORTHOPTERA.	Acrididae.	*Locusta m. migratorioides*, R. and F.	A. and L
ORTHOPTERA.	Acrididae.	*Nomadacris septemfasciata*, Serv.	A. and L..
Stem-borers.			
LEPIDOPTERA.	Noctuidae.	*Busseola fusca*, Full.	Larvae.
,,	Noctuidae.	*Sesamia calamistis*, Hmps.	,,
,,	Pyralidae.	*Chilo pyrocaustalis*, Hmps.	,,
,,	Pyralidae.	*Eldana saccharina*, Walk.	,,
Seed-heads.			
RHYNCHOTA.	Coreidae.	*Mirperus torridus*, Westw.	A. and L
,,	Lygaeidae.	*Lygaeus rivularis*, Germ.	Adults.
,,	Pentatomidae.	*Aethemenes chloris*, Westw.	Adults.
,,	,,	*Halydicoris scoruba*, Dall.	Larvae.
,,	,,	*Nezara viridula*, L.	Adults.
,,	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	A. and L.
(*c*) Bulrush Millet, *Pennisetum typhoides*, Stapf and Hubbard.			
Leaves.			
COLEOPTERA.	Curculionidae.	*Mitophorus acerbus*, Fst.	Adults.

COLEOPTERA.	Curculionidae.	*Siderodactylus sagittarius*, Oliv.	Adults.
ORTHOPTERA.	Acrididae.	*Acrotylus blondeli*, Sauss.	,,
,,	,,	*Heteropternis thoracica*, Wlk.	,,
,,	,,	*Hieroglyphus daganensis*, Kr.	,,
,,	,,	*Kraussaria angulifera*, Kr.	A. and L.
,,	,,	*Locusta m. migratorioides*, R. and F.	A. and L.
,,	,,	*Morphacris fasciata*, Thnbg., ab. *sulcata*, Thnbg.	Adults.
,,	,,	*Nomadacris septemfasciata*, Serv.	A. and L.
,,	,,	*Oedaleus nigeriensis*, Uv.	Adults.

Stem-borer.

LEPIDOPTERA.	Noctuidae.	*Busseola fusca*, Full.	Larvae.

Seed-heads.

COLEOPTERA.	Cetoniidae.	*Pachnoda interrupta*, F.	Adults.
COLEOPTERA.	Melyridae.	*Melyris abdominalis*, F.	Adults.
COLEOPTERA.	Melyridae.	*M. longipilis*, Pic.	Adults.
RHYNCHOTA.	Coreidae.	*Mirperus torridus*, Westw.	A. and L.
,,	Lygaeidae.	*Aspilocoryphus fasciativentris*, St.	Adults
,,	,,	*Lygaeus rivularis*, Germ.	A. and L.
,,	Pentatomidae.	*Acrosternum acutum*, Dall.	A. and L.
,,	,,	*Agonoscelis versicolor*, F.	A. and L.
,,	,,	*Aspavia acuminata*, Mont.	Adults. L.
,,	,,	*Halydicoris scoruba*, Dall.	A. and L.
,,	,,	*Nezara viridula*, L.	A. and L.
,,	,,	*Piezodorus pallescens*, Germ.	A. and L.
,,	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	Adults.

(*d*) Rice, *Oryza sativa*, Linn.

Leaves.

COLEOPTERA.	Hispidae.	*Trichispa sericea*, Guér.	Adults.
ORTHOPTERA.	Acrididae.	*Locusta m. migratorioides*, R. and F.	A. and L.
ORTHOPTERA.	Acrididae.	*Oxya hyla minor*, Sjöst.	Adults.
RHYNCHOTA.	Cercopidae.	*Locris maculata*, F.	Adults.

Seedlings.

ORTHOPTERA.	Gryllidae.	*Gryllotalpa africana*, P. de B.	A. and L.

Seed-heads (young ears).

COLEOPTERA.	Meloidae.	*Cylindrothorax westermanni*, Mäkl.	Adults.
RHYNCHOTA.	Coreidae.	*Leptocorisa apicalis*, Westw.	A. and L.
RHYNCHOTA.	Coreidae.	*Mirperus torridus*, Westw.	A. and L.
RHYNCHOTA.	Coreidae.	*Riptortus dentipes*, F.	Adults.
RHYNCHOTA.	Pentatomidae.	*Aspavia armigera*, F.	Adults.
RHYNCHOTA.	Pentatomidae.	*A. hastator*, F.	Adults.

(*e*) Finger Millet, *Eleusine corocana*, Gaertn.

Shoots.

DIPTERA.	Muscidae.	*Atherigona excisa*, Thoms.	Larvae.

Seed-heads.

RHYNCHOTA.	Lygaeidae.	*Paromius gracilis*, Ramb.	Adults.
,,	Pentatomidae.	*Aspavia acuminata*, Mont.	,,
,,	Pentatomidae.	*Durmia haedula*, St.	,,

IX.—LEGUMINOUS CROPS.

(*a*) Ground Nut, *Arachis hypogaea*, Linn.

Leaves.

COLEOPTERA.	Curculionidae.	*Mitophorus acerbus*, Fst.	Adults.
COLEOPTERA.	Galerucidae.	*Barombia humeralis*, Laboiss.	Adults.
LEPIDOPTERA.	Lymantriidae.	*Dasychira georgiana*, Fawc.	Larvae.
LEPIDOPTERA.	Psychidae.	*Metisa sierricola*, White.	Larvae.
RHYNCHOTA.	Capsidae.	*Halticus tibialis*, Reut.	A. and L.

Young shoots. (*—vector of virus disease, Rosette).

RHYNCHOTA.	Aphididae.	**Aphis laburni*, Kalt.	A. and L.

Stems.

RHYNCHOTA.	Coccidae.	*Ceronema africana*, Macfie.	A. and L.
RHYNCHOTA.	Coccidae.	*Ferrisiana virgata*, Ckll.	A. and L.

Flowers.

COLEOPTERA.	Melöidae.	*Decapotoma affinis*, Oliv.	Adults.

(*b*) Pigeon Pea, *Cajanus Cajan*, Druce.

Leaves.

RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.

Stems.

RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	,,
,,	Cercopidae.	*Ptyelus grossus*, F.	,,
,,	Coccidae.	*Ceronema africana*, Macfie.	,,
,,	Coccidae.	*Palaeococcus cajani*, Newst.	,,
,,	Coccidae.	*Stictococcus dimorphus*, Newst.	,,
,,	Plataspidae.	*Coptosoma marginella*, Dall.	Adults.
,,	Plataspidae.	*C. nubila*, Germ.	Adults.

Pods.

COLEOPTERA.	Lamiidae.	*Dichostates collaris*, Chev.	Adults.
LEPIDOPTERA.	Lycaenidae.	*Lampides boeticus*, L.	Larvae.
LEPIDOPTERA.	Pterophoridae.	*Marasmarcha atomosa*, Wlsm.	Larvae.

(*c*) Cowpea, *Vigna unguiculata*, Walp.

Leaves.

COLEOPTERA.	Galerucidae.	*Ootheca mutabilis*, Sahlb.	Adults.
COLEOPTERA.	Lagriidae.	*Lagria villosa*, F.	Adults.
COLEOPTERA.	Lagriidae.	*L. viridipennis*, F.	Adults.
LEPIDOPTERA.	Noctuidae.	*Azazia irrorata*, F.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	A. and L.
RHYNCHOTA.	Capsidae.	*Halticus tibialis*, Reut.	Adults.
,,	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.
,,	Lygaeidae.	*Chauliops rutherfordi*, Dist.	Adults.

Flowers.

COLEOPTERA.	Melöidae.	*Mylabris bifasciata*, Oliv.	Adults.

Green pods.

LEPIDOPTERA.	Lycaenidae.	*Euchrysops malathana*, Boisd.	Larvae.
,,	Lycaenidae.	*Lampides boeticus*, L.	,,
,,	Lycaenidae.	*Virachola antalus*, Hopff.	,,
,,	Pyralidae.	*Maruca testulalis*, Hb.	,,

Rhynchota.	Capsidae.	*Proboscidocoris fuliginosus*, Reut.	Adults.
,,	Coreidae.	*Acanthomyia horrida*, Germ.	,,
,,	,,	*A. tomentosicollis*, St.	,,
,,	,,	*Anoplocnemis curvipes*, F.	,,
,,	,,	*Mirperus torridus*, Westw.	,,
,,	,,	*Riptortus dentipes*, F.	,,
,,	Pentatomidae.	*Aspavia armigera*, F.	,,
,,	,,	*Halydicoris scoruba*, Dall.	A. and L.
,,	,,	*Halyomorpha annulicornis*, Sign.	Larvae.
,,	,,	*Nezara viridula*, L.	Larvae.

Seeds.

Coleoptera.	Curculionidae.	*Piezotrachelus pullus*, Boh.	A. and L.

(*d*) Lima Bean, *Phaseolus lunatus*, Linn.

Leaves.

Coleoptera.	Galerucidae.	*Barombia humeralis*, Laboiss.	Adults.
Coleoptera.	Galerucidae.	*Monolepta lineata*, Karsch.	Adults.
Lepidoptera.	Lymantriidae.	*Dasychira georgiana*, Fawc.	Larvae.
Lepidoptera.	Pyralidae.	*Lamprosema indicata*, F. (roller).	Larvae.
Rhynchota.	Capsidae.	*Halticus tibialis*, Reut.	Adults.

Young shoots.

Rhynchota.	Aphididae.	*Aphis laburni*, Kalt.	A. and L.

Stem.

Rhynchota.	Pentatomidae.	*Nezara viridula*, L.	A. and L.

Green pods.

Lepidoptera.	Lycaenidae.	*Virachola antalus*, Hopff.	Larvae.
Rhynchota.	Pentatomidae.	*Nezara viridula*, L.	A. and L.

Ripe beans.

Coleoptera.	Anthribidae.	*Araecerus fasciculatus*, de Geer.	Adults.
Coleoptera.	Scolytidae.	*Cryphalus hampei*, Ferr.	Adults.
Lepidoptera.	Eucosmidae.	*Argyroploce leucotreta*, Meyr.	Larvae.
,,	Eucosmidae.	*Laspeyresia ptychora*, Meyr.	,,
,,	Lyonetiidae.	*Plemyristis oenochares*, Meyr.	,,
,,	Pyralidae.	*Etiella zinckenella*, Treit.	,,
,,	,,	*Lamprosema niphealis*, Wlk.	,,
,,	,,	*L. peonalis*, Wlk.	,,
,,	,,	*Mussidia nigrinervella*, Rag.	,,

(*e*) Soya Bean, *Soja max*, Merr.

Leaves.

Coleoptera.	Galerucidae.	*Barombia humeralis*, Laboiss.	Adults.
Coleoptera.	Galerucidae.	*Ootheca mutabilis*, Sahlb.	Adults.
Orthoptera.	Acrididae.	*Zonocerus variegatus*, L.	Larvae.
Rhynchota.	Capsidae.	*Halticus tibialis*, Reut.	Adults.

Stems.

Rhynchota.	Plataspidae.	*Coptosoma marginella*, Dall.	Adults.

(*f*) Bengal Bean, *Mucuna aterrima*, P. and T.

Leaves.

Coleoptera.	Curculionidae.	*Mitophorus acerbus*, Fst.	Adults.
,,	Galerucidae.	*Barombia humeralis*, Laboiss.	,,
,,	Galerucidae.	*Ootheca mutabilis*, Sahlb.	,,
,,	Hispidae.	*Platypria luctuosa*, Chap.	,,

LEPIDOPTERA.	Arctiidae.	*Diacrisia occidens*, Roths.	Larvae.
,,	Noctuidae.	*Phytometra acuta*, Wlk.	,,
,,	Saturniidae.	*Bunaea rhodophila*, Wlk.	,,
RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.
Shoots.			
RHYNCHOTA.	Plataspidae.	*Coptosoma marginella*, Dall.	Adults.
Green pods.			
RHYNCHOTA.	Pentatomidae.	*Nezara viridula*, L.	Larvae.

(*g*) Lablab Bean, *Dolichos Lablab*, Linn.

Leaves.			
COLEOPTERA.	Galerucidae.	*Barombia humeralis*, Laboiss.	Adults.
COLEOPTERA.	Galerucidae.	*Ootheca mutabilis*, Sahlb.	Adults.
LEPIDOPTERA.	Arctiidae.	*Diacrisia lutescens*, Wlk.	Larvae.
LEPIDOPTERA.	Arctiidae.	*D. occidens*, Roths.	Larvae.
RHYNCHOTA.	Jassidae.	*Empoasca dolichi*, Paoli.	A. and L.
RHYNCHOTA.	Lygaeidae.	*Chauliops rutherfordi*, Dist.	Adults.
Stems.			
RHYNCHOTA.	Coreidae.	*Anoplocnemis curvipes*, F.	A. and L.
RHYNCHOTA.	Coreidae.	*Clavigralla gibbosa*, Spin.	A. and L.
RHYNCHOTA.	Plataspidae.	*Coptosoma marginella*, Dall.	Adults.
Pods.			
RHYNCHOTA.	Coreidae.	*Clavigralla gibbosa*, Spin.	A. and L.

(*h*) Sword Bean, *Canavalia ensiformis*, DC.

Leaves.			
COLEOPTERA.	Galerucidae.	*Ootheca mutabilis*, Sahlb.	Adults.
RHYNCHOTA.	Coreidae.	*Anoplocnemis curvipes*, F.	,,
Shoots.			
RHYNCHOTA.	Coreidae.	*Anoplocnemis curvipes*, F.	,,
Pods.			
RHYNCHOTA.	Coreidae.	*Riptortus tenuicornis*, Dall.	,,

(*i*) *Tephrosia candida*, Pers.

Leaves.			
ORTHOPTERA.	Acrididae.	*Catantops spissus*, Wlk.	Adults.
ORTHOPTERA.	Acrididae.	*Rutidoderes squarrosus*, L.	Adults.
RHYNCHOTA.	Aleurodidae.	*Aleuromarginatus tephrosiae*, Corb.	A. and L.
RHYNCHOTA.	Tettigometridae.	*Hilda undata*, Wlk.	A. and L.
Shoots.			
RHYNCHOTA.	Cercopidae.	*Ptyelus grossus*, F.	Adults.
RHYNCHOTA.	Coreidae.	*Riptortus dentipes*, F.	A. and L.
RHYNCHOTA.	Plataspidae.	*Coptosoma marginella*, Dall.	Adults.
Buds.			
RHYNCHOTA.	Coreidae.	*Riptortus dentipes*, F.	A. and L.
RHYNCHOTA.	Lygaeidae.	*Graptostethus rufus*, F.	Adults.
Flowers.			
COLEOPTERA.	Cetoniidae.	*Glycyphana sanguinolenta*, Oliv.	Adults.
Pods.			
RHYNCHOTA.	Coreidae.	*Riptortus dentipes*, F.	A. and L.
RHYNCHOTA.	Pentatomidae.	*Halyomorpha annulicornis*, Sign.	A. and L.

X. FIBRE CROPS.

(*a*) Cotton, *Gossypium spp.*

Leaves. (*vector of virus disease, Leaf Curl).

COLEOPTERA.	Buprestidae.	*Agrilus capensis*, Murray.	Adults.
,,	Buprestidae.	*Pseudagrilus sophorae*, F.	,,
,,	Cassididae.	*Aspidomorpha chlorina*, Boh.	,,
,,	Cassididae.	*A. isparetta*, Boh.	,,
,,	Chrysomelidae.	*Plagiodera circumcincta*, Sahlb.	,,
,,	Coccinellidae.	*Epilachna similis*, Thnbg., var. *assimilis*, Muls.	,,
,,	Cryptocephalidae.	*Cryptocephalus bifasciatus*, F.	,,
,,	,,	*C. obesus*, Suff.	,,
,,	,,	*C. simplex*, Suff.	,,
,,	,,	*C. w-nigrum*, Suff.	,,
,,	Curculionidae.	*Mitophorus acerbus*, Fst.	,,
,,	Curculionidae.	*Siderodactylus sagittarius*, Oliv.	,,
,,	Eumolpidae.	*Eryxia holosericea*, Klug.	,,
,,	,,	*Eurydemus gossypii*, Bryant.	,,
,,	,,	*Pagria gossypii*, Bryant.	,,
,,	,,	*Syagrus calcaratus*, F.	,,
,,	Galerucidae.	*Barombia humeralis*, Laboiss.	,,
,,	Galerucidae.	*Ootheca mutabilis*, Sahlb.	,,
,,	Halticidae.	*Haltica punctata*, All.	,,
,,	,,	*Podagrica dilecta*, Dalm.	,,
,,	,,	*P. spadicea*, Dalm.	,,
,,	,,	*P. uniforma*, Jac.	,,
,,	Lagriidae.	*Lagria villosa*, F.	,,
,,	Lagriidae.	*L. viridipennis*, F.	,,
,,	Melolonthidae.	*Pseudotrochalus concolor*, Kolbe.	,,
LEPIDOPTERA.	Arctiidae.	*Amsacta flavicosta*, Hmps.	Larvae.
,,	Arctiidae.	*Diacrisia maculosa*, Cram.	,,
,,	Geometridae.	*Alcis acaciaria*, Boisd.	,,
,,	Geometridae.	*Nemoria stibolepida*, Butl.	,,
,,	Gracilariidae.	*Acrocercops bifasciata*, Wlsm. (miner).	,,
,,	Lasiocampidae.	*Leipoxais siccifolia*, Auriv.	,,
,,	Limacodidae.	*Parasa infuscata*, Wied.	,,
,,	Lymantriidae.	*Euproctis lyonia*, Swinth.	,,
,,	Lymantriidae.	*E. fasciata*, Walk.	,,
,,	Lyonetiidae.	*Bucculatrix loxoptila*, Meyr.	,,
,,	Noctuidae.	*Cosmophila erosa*, Hb.	,,
,,	,,	*C. flava*, F.	,,
,,	,,	*Phytometra chalcites*, Esp.	,,
,,	,,	*Prodenia litura*, F.	,,
,,	,,	*Xanthodes graellsi*, Feisth.	,,
,,	Nymphalidae.	*Leucosticha daedalus*, F.	,,
,,	Psychidae.	*Clania cervina*, Druce.	,,
,,	Pyralidae.	*Sylepta derogata*, F. (roller).	,,
,,	Pyralidae.	*Zebronia phenice*, Cram. (roller).	,,
,,	Tortricidae.	*Cacoecia occidentalis*, Wals.	,,
ORTHOPTERA.	Acrididae.	*Acanthacris ruficornis citrina*, Serv.	Adults.
,,	,,	*Catantops axillaris*, *Thnbg.*	Adults.
,,	,,	*Cyrtacanthacris aeruginosa unicolor*, Uv.	Larvae.
,,	,,	*Oedaleus senegalensis*, Kr.	Adults.

ORTHOPTERA.	Acrididae.	*Phymateus karschi*, Bol.	Adults.
,,	,,	*Zonocerus variegatus*, L.	A. and L.
RHYNCHOTA.	Aleurodidae.	**Bemisia goldingi*, Corb.	A. and L.
,,	Aphididae.	*Aphis gossypii*, Glov.	,,
,,	Capsidae.	*Halticus tibialis*, Reut.	,,
,,	Capsidae.	*Helopeltis sanguineus*, Popp.	,,
,,	Jassidae.	*Empoasca facialis*, Jac.	,,
,,	Lygaeidae.	*Chauliops rutherfordi*, Dist.	Adults.
Petioles.			
RHYNCHOTA.	Pentatomidae.	*Atelocera raptoria*, Germ.	Adults.
Young shoots.			
RHYNCHOTA.	Aphididae.	*Aphis gossypii*, Glov.	A. and L.
RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.
Stems.			
COLEOPTERA.	Buprestidae.	*Pseudagrilus sophorae*, L. (borer).	Larvae.
RHYNCHOTA.	Coccidae.	*Hemichionaspis minor*, Maskell.	A. and L.
,,	,,	*Lecanium inopheron*, Laing.	,,
,,	,,	*Pulvinaria jacksoni*, Newst.	,,
Roots.			
COLEOPTERA.	Buprestidae.	*Sphenoptera gossypii*, Cotes.	Larvae.
COLEOPTERA.	Eumolpidae.	*Syagrus calcaratus*, F.	Larvae.
Seedlings.			
HYMENOPTERA.	Formicidae.	*Messor barbara*, L.	Adults.
Buds.			
LEPIDOPTERA.	Gelechiidae.	*Platyedra gossypiella*, Saund.	Larvae.
,,	Noctuidae.	*Diparopsis castanea*, Hmps.	,,
,,	,,	*Earias biplaga*, Walk.	,,
,,	,,	*E. insulana*, Boisd.	,,
RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.
Flowers.			
COLEOPTERA.	Cetoniidae.	*Pachnoda cordata*, Drury.	Adults.
COLEOPTERA.	Melöidae.	*Decapotoma affinis*, Oliv.	,,
THYSANOPTERA.	Thripidae.	*Physothrips sjöstedti*, Trybon.	,,
Green bolls.			
COLEOPTERA.	Cetoniidae.	*Diplognatha gagates*, Forst.	,,
COLEOPTERA.	Cetoniidae.	*Pachnoda cordata*, Drury.	,,
DIPTERA.	Chloropidae.	*Epimadiza gallicola*, Séguy.	Larvae.
LEPIDOPTERA.	Eucosmidae.	*Argyroploce leuctotreta*, Meyr.	,,
,,	Gelechiidae.	*Platyedra gossypiella*, Saund.	,,
,,	Noctuidae.	*Diparopsis castanea*, Hmps.	,,
,,	,,	*Earias biplaga*, Walk.	,,
,,	,,	*E. insulana*, Boisd.	,,
,,	,,	*Heliothis armigera*, Hübn.	,,
,,	,,	*Prodenia litura*, F.	,,
,,	Pyralidae.	*Mussidia nigrinervella*, Rag.	,,
RHYNCHOTA.	Coreidae.	*Acanthomyia tomentosicollis*, St.	Adults.
,,	,,	*Anoplocnemis curvipes*, F.	A. and L.
,,	,,	*Mirperus torridus*, Westw.	A. and L.

RHYNCHOTA.	Pentatomidae.	*Acrosternum acutum*, Dall.	Adults.
,,	,,	*Aethemenes chloris*, Westw.	,,
,,	,,	*Agonoscelis versicolor*, F.	,,
,,	,,	*Aspavia armigera*, F.	,,
,,	,,	*Atelocera raptoria*, Germ.	A. and L.
,,	,,	*Halydicoris scoruba*, Dall.	Adults.
,,	,,	*Hotea subfasciata*, Westw.	Adults.
,,	,,	*Mecosoma mensor*, Germ.	A. and L.
,,	,,	*Nezara viridula*, L.	A. and L.
,,	,,	*Piezodorus pallescens*, Germ.	Adults.
,,	,,	*Steganocerus multipunctatus*, Thnbg., var. *argus*, F.	A. and L.
,,	Pyrrhocoridae.	*Dysdercus fasciatus*, Sign.	Adults.
,,	,,	*D. haemorrhoidalis*, Sign.	A. and L.
,,	,,	*D. melanoderes*, Karsch.	Adults.
,,	,,	*D. nigrofasciatus*, Stål.	A. and L.
,,	,,	*D. superstitiosus*, F.	

Dried open bolls.

LEPIDOPTERA.	Cosmopterygidae.	*Pyroderces coriacella*, Snell.	Larvae.
,,	Cosmopterygidae.	*P. simplex*, Wlsm.	,,
,,	Gelechiidae.	*Mometa zemoides*, Durr.	,,
,,	Gelechiidae.	*Platyedra gossypiella*, Saund.	,,
,,	Lyonetiidae.	*Plemyristis oenochares*, Meyr.	,,
RHYNCHOTA.	Lygaeidae.	*Oxycarenus dudgeoni*, Dist.	A. and L.
RHYNCHOTA.	Lygaeidae.	*O. gossypinus*, Dist.	A. and L.

(*b*) Hemp-leaved Hibiscus, *Hibiscus cannabinus*, Linn.

Leaves.

COLEOPTERA.	Halticidae.	*Podagrica dilecta*, Dalm.	Adults.
,,	,,	*P. spadicea*, Dalm.	,,
,,	,,	*P. uniforma*, Jac.	,,

Seeds

RHYNCHOTA.	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	A. and L.

(*c*) *Urena lobata*, Linn.

Leaves.

COLEOPTERA.	Buprestidae.	*Pseudagrilus sophorae*, L.	Adults.
,,	Cassididae.	*Aspidomorpha confinis*, Klug.	,,
,,	Coccinellidae.	*Epilachna similis*, Thnbg., var. *assimilis*, Muls.	,,
,,	Curculionidae.	*Mitophorus acerbus*, Fst.	,,
,,	Halticidae.	*Podagrica dilecta*, Dalm.	,,
,,	,,	*P. spadicea*, Dalm.	,,
,,	,,	*P. uniforma*, Jac.	,,

Stems.

RHYNCHOTA.	Coccidae.	*Hemichionaspis minor*, Maskell.	A. and L.

Seeds.

RHYNCHOTA.	Pentatomidae.	*Hotea subfasciata*, Westw.	Adults.
RHYNCHOTA.	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	A. and L.

(*d*) Jute, *Corchorus capsularis*, Linn.

Seeds.

RHYNCHOTA.	Lygaeidae.	*Graptostethus servus*, F.	A. and L.
,,	,,	*Oxycarenus dudgeoni*, Dist.	Adults.
,,	,,	*O. gossypinus*, Dist.	A. and L.

(*e*) Long-fruited Jute, *Corchorus olitorius*, Linn.

Leaves.

COLEOPTERA.	Halticidae.	*Podagrica dilecta*, Dalm.	Adult.
COLEOPTERA.	Halticidae.	*P. uniforma*, Jac.	Adults.
LEPIDOPTERA.	Nymphalidae.	*Acraea terpsichore*, L.	Larvae.

Seeds.

RHYNCHOTA.	Lygaeidae.	*Graptostethus servus*, F.	A. and L.

XI.—BENISEED, *Sesamum indicum*, Linn.

Leaves.

COLEOPTERA.	Curculionidae.	*Mitophorus acerbus*, Fst.	Adults.
COLEOPTERA.	Curculionidae.	*Siderodactylus sagittarius*, Oliv.	Adults.

Young shoots.

RHYNCHOTA.	Aphididae.	*Myzus persicae*, Sulz.	A. and L.

Green pods.

RHYNCHOTA.	Pentatomidae.	*Agonoscelis versicolor*, F.	A. and L.
RHYNCHOTA.	Pentatomidae.	*Phricodus hystrix*, Germ.	Adults.
RHYNCHOTA.	Pentatomidae.	*Veterna mimica*, Dist.	Adults.

XII.—TOBACCO, *Nicotiana Tabacum*, Linn.

Leaves. (*—vector of virus disease, Leaf Curl).

LEPIDOPTERA.	Noctuidae.	*Phytometra rutilifrons*, Wlk.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
ORTHOPTERA.	Acrididae.	*Catantops melanostictus*, Schaum.	Adults.
RHYNCHOTA.	Aleurodidae.	**Bemisia sp.*	A. and L.

Stems.

LEPIDOPTERA.	Tineidae.	*Gnorimoschema heliopa*, Low.	Larvae.

Pods.

LEPIDOPTERA.	Noctuidae.	*Heliothis armigera*, Hübn.	"
LEPIDOPTERA.	Tineidae.	*Setomorpha rutella*, Zell.	"

XIII.—'EGUSI,' *Citrullus vulgaris*, Schrad.

Leaves.

COLEOPTERA.	Coccinellidae.	*Epilachna chrysomelina*, F.	Adults.

Fruits.

RHYNCHOTA.	Coreidae.	*Leptoglossus membranaceus*, F.	A. and L.

XIV.—VEGETABLES.

(*a*) *Cabbage.*

Leaves.

LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
ORTHOPTERA.	Acrididae.	*Catantops melanostictus*, Schaum.	Adults.

Stalks.

DIPTERA.	Muscidae.	*Atherigona excisa*, Thoms.	Larvae.

Roots.

LEPIDOPTERA.	Pyralidae.	*Hellula undalis*, F.	Larvae.

(*b*) *Cauliflower.*

Stems.

COLEOPTERA.	Anthribidae.	*Araecerus fasciculatus*, de Geer.	"

(*c*) *Kohl Rabi.*

Leaves.

LEPIDOPTERA.	Hesperiidae.	*Rhopalocampta forestan*, Cram.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Plusia orichalcea*, F.	,,
LEPIDOPTERA.	Pyralidae.	*Crocidoloma binotalis*, Zell.	,,

(*d*) *Turnips.*

Leaves.

LEPIDOPTERA.	Pyralidae.	*Crocidoloma binotalis*, Zell.	
LEPIDOPTERA.	Pyralidae.	*Hellula undalis*, F.	,,
ORTHOPTERA.	Acrididae.	*Pyrgomorpha kraussi*, Uv.	Adults.

(*e*) *Beetroot.*

Leaves.

LEPIDOPTERA.	Pyralidae.	*Hymenia fascialis*, Cram.	Larvae.

(*f*) *French Beans.*

Leaves.

COLEOPTERA.	Galerucidae.	*Monolepta lineata*, Karsch.	Adults.

(*g*) *Pumpkins.*

Leaves.

ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	A. and L.

(*h*) Cucumber, *Cucumis sativus*, Linn.

Shoots.

RHYNCHOTA.	Coreidae.	*Leptoglossus membranaceus*, F.	Larvae.

(*i*) Snake Gourd, *Trichosanthes Anguina*, Linn.

Shoots.

RHYNCHOTA.	Coreidae.	*Leptoglossus membranaceus*, F.	A. and L.

(*j*) Garden Egg, *Solanum Melongena*, Linn.

Leaves.

COLEOPTERA.	Buprestidae.	*Pseudagrilus leonensis*, Kerr.	Adults.
LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
LEPIDOPTERA.	Sphingidae.	*Acherontia atropos*, L.	Larvae.
RHYNCHOTA.	Pentatomidae.	*Platynopus rostratus*, Dru.	Adults.

Shoots.

COLEOPTERA.	Cetoniidae.	*Diplognatha gagates*, F.	,,

Stems.

COLEOPTERA.	Cetoniidae.	*Pachnoda cordata*, Drury.	,,

(*k*) Okra, *Hibiscus esculentus*, Linn.

Leaves.

COLEOPTERA.	Buprestidae.	*Pseudagrilus sophorae*, L.	,,
,,	Eumolpidae.	*Syagrus calcaratus*, F.	,,
,,	Halticidae.	*Podagrica dilecta*, Dalm.	,,
,,	,,	*P. spadicea*, Dalm.	,,
,,	,,	*P. uniforma*, Jac.	,,
LEPIDOPTERA.	Lymantriidae.	*Orgyia niobe*, Weym.	Larvae.
,,	Noctuidae.	*Cosmophila erosa*, Hb.	,,
,,	Noctuidae.	*Xanthodes graellsi*, Feisth.	,,
,,	Pyralidae.	*Sylepta derogata*, F. (roller).	,,
,,	Pyralidae.	*Zebronia phenice*, Cram. (roller).	,,

ORTHOPTERA.	Acrididae.	*Catantops axillaris*, Thnbg.	Adults
ORTHOPTERA.	Acrididae.	*Cyrtacanthacris aeruginosa unicolor*, Uv.	Larvae.
RHYNCHOTA.	Capsidae.	*Halticus tibialis*, Reut.	Adults.
Stems.			
COLEOPTERA.	Buprestidae.	*Pseudagrilus sophorae*, L. (borer).	Larvae.
RHYNCHOTA.	Coccidae.	*Hemichionaspis minor*, Maskell.	A. and L.
RHYNCHOTA.	Coreidae.	*Anoplocnemis curvipes*, F.	,,
Buds.			
RHYNCHOTA.	Coreidae.	*Anoplocnemis curvipes*, F.	,,
Pods.			
LEPIDOPTERA.	Gelechiidae.	*Platyedra gossypiella*, Saund.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Earias biplaga*, Walk.	Larvae.
RHYNCHOTA.	Lygaeidae.	*Oxycarenus dudgeoni*, Dist.	Adults.
,,	Lygaeidae.	*O. gossypinus*, Dist.	Adults.
,,	Pyrrhocoridae.	*Dysdercus melanoderes*, Karsch.	Adults.
,,	Pyrrhocoridae.	*D. superstitiosus*, F.	A. and L.

(*l*) Roselle, *Hibiscus Sabdariffa*, Linn.

Leaves.			
COLEOPTERA.	Buprestidae.	*Pseudagrilus sophorae*, L.	Adults.
,,	Halticidae.	*Podagrica dilecta*, Dalm.	,,
,,	Halticidae.	*P. spadicea*, Dalm.	,,
,,	Halticidae.	*P. uniforma*, Jac.	,,
Midrib of leaf.			
RHYNCHOTA.	Coreidae.	*Mirperus torridus*, Westw.	,,
Pods.			
RHYNCHOTA.	Pyrrhocoridae.	*Dysdercus melanoderes*, Karsch.	,,
RHYNCHOTA.	Pyrrhocoridae.	*D. superstitiosus*, F.	A. and L.

(*m*) Spinach, *Amaranthus caudatus*, Linn.

Leaves.			
COLEOPTERA.	Curculionidae.	*Mitophorus acerbus*, Fst.	Adults.
COLEOPTERA.	Curculionidae.	*Siderodactylus sagittarius*, Oliv.	Adults.
LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
LEPIDOPTERA.	Nymphalidae.	*Hypolimna misippus*, L.	,,
ORTHOPTERA.	Acrididae.	*Atractomorpha gerstaeckeri*, I. Bol.	,,
Flowers.			
RHYNCHOTA.	Coreidae.	*Cletus fuscescens*, Wlk.	Adults.
(*n*) *Tomatoes.*			
Leaves.			
LEPIDOPTERA.	Noctuidae.	*Heliothis armigera*, Hübn.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Prodenia litura*, F.	Larvae.
Fruits.			
DIPTERA.	Muscidae.	*Atherigona excisa*, Thoms.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Achaea lienardi*, Boisd.	Adults.
(*o*) *Onions.*			
Leaves.			
LEPIDOPTERA.	Arctiidae.	*Diacrisia maculosa*, Cram.	Larvae.

XV.—FRUIT TREES.

(*a*) *Citrus spp.*—(Sweet Orange and Grapefruit except where indicated by O—Orange, G—Grapefruit, T—Tangerine, Le—Lemon and Li—Lime).

Leaves

COLEOPTERA.	Cetoniidae.	*Pachnoda cordata*, Drury.	Adults.
COLEOPTERA.	Melolonthidae.	*Pseudotrochalus concolor*, Kolbe. (Le, Li).	Adults.
LEPIDOPTERA.	Lasiocampidae.	*Gonometa subfascia*, Wlk. (O).	Larvae.
,,	Papilionidae.	*Papilio demodocus*, Esp.	,,
,,	Papilionidae.	*P. nireus*, L.	,,
,,	Saturniidae.	*Bunaea rhodophila*, Wlk. (G).	,,
ORTHOPTERA.	Acrididae.	*Rhytidacris tectifera*, Karsch. (G).	Adults.
ORTHOPTERA.	Acrididae.	*Rutidoderes squarrosus*, L.	Adults.
RHYNCHOTA.	Tettigometridae.	*Hilda undata*, Wlk. (G).	A. and L.

Shoots.

COLEOPTERA.	Lycidae.	*Cautires dilucidus*, Kln.	Adults.
RHYNCHOTA.	Capsidae	*Distantiella theobroma*, Dist. (O, G, Le).	A. and L.
,,	Cercopidae.	*Ptyelus grossus*, F. (G).	Larvae.
,,	Coreidae.	*Anoplocnemis curvipes*, F.	A. and L.
,,	Coreidae.	*Riptortus tenuicornis*, Dall. (O).	Adults.
,,	Pantatomidae.	*Caura pugillator*, F. (O).	,,
,,	Ricaniidae.	*Ricanopsis nebulosa*, F.	,,
,,	Ricaniidae.	*Ricanula detersa*, Mel.	,,

Stem-borer.

COLEOPTERA.	Bostrychidae.	*Apate monacha*, F. (O).	,,

Trunks.

ISOPTERA.	Termitidae.	*Amitermes evuncifer*, Silv., var *heterocera*, Silv.	,,

Flowers.

COLEOPTERA.	Cetoniidae.	*Pachnoda cordata*,, Drury.	Adults.
COLEOPTERA.	Cetoniidae.	*P. marginella*, F. (O).	,,

Fruits.

COLEOPTERA.	Cetoniidae.	*Incala schoutedeni*, Moser. (O).	,,
LEPIDOPTERA.	Eucosmidae.	*Argyroploce leucotreta*, Meyr. (T).	Larvae.
,,	Noctuidae.	*Achaea boris*, Gey.	Adults.
,,	,,	*A. catella*, Guen.	,,
,,	,,	*A. faber*, Holl. (O, G, T).	,,
,,	,,	*A. lienardi*, Boisd. (O, G, T).	,,
,,	,,	*A. mercatoria*, F.	,,
,,	,,	*A. mormoides*, Wlk.	,,
,,	,,	*Anomis leona*, Schaus.	,,
,,	,,	*Anua gonoptera*, Hmps.	,,
,,	,,	*Audea endophaea*, Hmps.	,,
,,	,,	*Caligatus angasi*, Wing.	,,
,,	,,	*Cyligramma limacina*, Guen.	,,
,,	,,	*Dermaleipa parallelipipeda*, Guen.	,,
,,	,,	*Heliophisma catocalina*, Holl.	,,
,,	,,	*Lacera alope*, Stoll.	,,
,,	,,	*Miniodes discolor*, Guen.	,,
,,	,,	*Mocis undata*, F.	,,
,,	,,	*Othreis divitiosa*, Wlk.	,,
,,	,,	*O. fullonia*, Cl.	,,

LEPIDOPTERA.	Noctuidae.	*Othreis materna*, L.	Adults.
,,	,,	*Sphingomorpha chlorea*, Cram.	,,
,,	Satyridae.	*Melanitis leda ismene*, Cram. (G)	,,
RHYNCHOTA.	Coreidae.	*Leptoglossus membranaceus*, F. (O, G, T).	,,
,,	Pentatomidae.	*Acrosternum punctato-rugosum*, St. (G).	,,
,,	Pentatomidae.	*Bathycoelia thalassina*, H. Sch. (O).	,,

(*b*) Mango, *Mangifera indica*, Linn.

Leaves.

LEPIDOPTERA.	Lasiocampidae.	*Gonometa nysa*, Druce.	Larvae.
LEPIDOPTERA.	Lasiocampidae.	*G. subfascia*, Wlk.	,,
ORTHOPTERA.	Acrididae.	*Stenocrobylus festivus*, Karsch.	Adults.
RHYNCHOTA.	Coreidae.	*Theraptus devastans*, Dist.	,,
THYSANOPTERA.	Thripidae.	*Selenothrips rubrocinctus*, Giard.	A. and L.

Midrib of leaf.

RHYNCHOTA.	Coreidae.	*Anoplocnemis tristator*, F.	Larvae.

Petioles.

RHYNCHOTA.	Coreidae.	*Plectrocnemia oblongipes*, F.	Adults.

Shoots.

LEPIDOPTERA.	Lasiocampidae.	*Gonometa subfascia*, Wlk.	Larvae.
RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.
RHYNCHOTA.	Pentatomidae.	*Atelocera raptoria*, Germ.	Adul s.

Flowers.

COLEOPTERA.	Cetoniidae.	*Pachnoda marginella*, F.	,,

Fruits.

COLEOPTERA.	,,	*Heterorrhina suturalis*, F.	,,
,,	,,	*Incala schoutedeni*, Moser.	,,
,,	,,	*Pachnoda cordata*, Drury.	,,
,,	,,	*P. marginella*, F.	,,
,,	,,	*Plaesiorrhina recurva*, F.	,,
LEPIDOPTERA.	Noctuidae.	*Dermaleipa metaphaea*, Hmps.	,,
,,	,,	*Lophotavia incivilis*, Wlk.	,,
,,	,,	*Nagia natalensis*, Hmps.	,,
		Also nearly all the twenty species of Noctuid moths shown above as attacking Citrus fruits.	
RHYNCHOTA.	Coreidae.	*Leptoglossus membranaceus*, F.	Adults
RHYNCHOTA.	Pyrrhocoridae.	*Dysdercus superstitiosus*, F.	Adults

(*c*) Guava, *Psidium guajava*, Linn.

Leaves.

COLEOPTERA.	Curculionidae.	*Apoderus fuscicornis*, Oliv.	Adults.
ORTHOPTERA.	Acrididae.	*Stenocrobylus festivus*, Karsch.	A. and L.
RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.

Shoots.

RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.

Fruits.

DIPTERA.	Trypetidae.	*Pterandrus anonae*, Graham.	Larvae.
LEPIDOPTERA.	Eucosmidae.	*Argyroploce leucotreta*, Meyr.	Larvae.
LEPIDOPTERA.	Noctuidae.	*Achaea lienardi*, Boisd.	Adults.

(*d*) Sour-sop, *Anona muricata*, Linn.

Fruits

COLEOPTERA.	Cetoniidae.	*Diplognatha gagates*, F.	Adults.
DIPTERA.	Trypetidae.	*Pterandrus anonae*, Graham.	Larvae.

(*e*) Cashew, *Anacardium, occidentale*, Linn.

Leaves.

THYSANOPTERA.	Thripidae.	*Selenothrips rubrocinctus*, Giard.	A. and L.

Shoots.

RHYNCHOTA.	Capsidae.	*Helopeltis sanguineus*, Popp.	A. and L.

Fruits.

COLEOPTERA.	Cetoniidae.	*Heterorrhina suturalis*, F.	Adults.
,,	,,	*Pachnoda cordata*, Drury.	,,
,,	,,	*Plaesiorrhina recurva*, F.	,,

(*f*) Pineapple, *Ananas sativus*, Schult.

Leaves.

ORTHOPTERA.	Acrididae.	*Locusta m. migratorioides*, R. and F.	,,

Stems.

RHYNCHOTA.	Coccidae.	*Pseudococcus brevipes*, Ckll.	A. and L.

Fruits.

COLEOPTERA.	Nitidulidae.	*Carpophilus humeralis*, F.	Adults.

(*g*) Banana, *Musa sapientum*, Linn.

Leaves.

ORTHOPTERA.	Acrididae.	*Locusta m. migratorioides*, R. and F.	Adults.
ORTHOPTERA.	Acrididae.	*Zonocerus variegatus*, L.	Larvae.
RHYNCHOTA.	Coccidae.	*Aspidiotus destructor*, Sign.	A. and L.

Fruits.

LEPIDOPTERA.	Noctuidae.	*Cyligramma simplex*, Grünb.	Adults.

XVI.—STORED PRODUCTS.

(*a*) *Palm Kernels.*

COLEOPTERA.	Cleridae.	*Necrobia rufipes*, de G.	A. and L.
,,	Cucujidae.	*Oryzaephilus mercator*, Fauv.	,,
,,	Dermestidae.	*Dermestes maculatus*, de G.	,,
LEPIDOPTERA.	Pyralidae.	*Ephestia cautella*, Wlk.	Larvae.

(*b*) *Imported Copra.*

COLEOPTERA.	Dermestidae.	*Dermestes ater*, de G.	A. and L.

(*c*) *Cocoa Beans.*

COLEOPTERA.	Anobiidae.	*Lasioderma serricorne*, F.	,,
,,	Anthribidae.	*Araecerus fasciculatus*, de Geer.	,,
,,	Tenebrionidae.	*Tribolium castaneum*, Herbst.	,,
LEPIDOPTERA.	Pyralidae.	*Corcyra cephalonica*, Staint.	Larvae.
,,	,,	*Culladia inconspicuella*, Snellen.	,,
,,	,,	*Ephestia cautella*, Wlk.	,,

(*d*) *Kola Nuts.*

COLEOPTERA.	Curculionidae.	*Balanogastris kolae*, Desbr.	A. and L.
COLEOPTERA.	Curculionidae.	*Paremydica insperata*, Fst.	,,

(*e*) *Shea Nuts.*			
COLEOPTERA.	Tenebrionidae.	*Tribolium castaneum*, Herbst.	A. and L.
(*f*) *Yams.*			
COLEOPTERA.	Anthribidae.	*Araecerus fasciculatus*, de Geer.	,,
(*g*) *Sweet Potatoes.*			
COLEOPTERA.	Curculionidae.	*Cylas brunneus*, F.	,,
COLEOPTERA.	Curculionidae.	*C. puncticollis*, Boh	,,
(*h*) *Cassava Starch.*			
COLEOPTERA.	Bostrychidae.	*Dinoderus minutus*, F.	,,
(*i*) *Grain.*			
COLEOPTERA.	Bostrychidae.	*Rhizopertha dominica*, F.	,,
,,	Cucujidae.	*Laemophloeus pusillus*, Schön.	,,
,,	Curculionidae.	*Calandra oryzae*, L.	,,
,,	Tenebrionidae.	*Tribolium castaneum*, Herbst.	,,
,,	Trogositidae.	*Tenebroides mauritanicus*, L.	,,
LEPIDOPTERA.	Gelechiidae.	*Sitotroga cerealella*, Ol.	Larvae.
,,	Pyralidae.	*Corcyra cephalonica*, Staint.	,,
,,	Pyralidae.	*Ephestia cautella*, Wlk.	,,
,,	Pyralidae.	*Plodia interpunctella*, Hb.	,,
(*j*) *Ground Nuts.*			
COLEOPTERA.	Bruchidae.	*Pachymerus longus*, Pic.	A. and L.
,,	Tenebrionidae.	*Tribolium castaneum*, Herbst.	,,
,,	Trogositidae.	*Tenebroides mauritanicus*, L.	,,
LEPIDOPTERA.	Pyralidae.	*Ephestia cautella*, Wlk.	Larvae.
RHYNCHOTA.	Lygaeidae.	*Aphanus littoralis*, Dist.	A. and L.
(*k*) Bambara Groundnut, *Voandzeia subterranea*, Thouars.			
COLEOPTERA.	Bruchidae.	*Bruchus phaseoli*, Gyll., var	,,
(*l*) *Cowpeas.*			
COLEOPTERA.	Bruchidae.	*Bruchus analis*, F.	,,
COLEOPTERA.	Curculionidae.	*Piezotrachelus pullus*, Boh.	,,
LEPIDOPTERA.	Pyralidae.	*Plodia interpunctella*, Hb.	Larvae.
(*m*) *Cotton Seed.*			
COLEOPTERA.	Tenebrionidae.	*Alphitobius laevigatus*, F.	,,
LEPIDOPTERA.	Gelechiidae.	*Platyedra gossypiella*, Saund.	,,
LEPIDOPTERA.	Pyralidae.	*Ephestia cautella*, Wlk.	,,
(*n*) *Tobacco Leaf.*			
COLEOPTERA.	Anobiidae.	*Lasioderma serricorne*, F.	A. and L.
COLEOPTERA.	Dermestidae.	*Dermestes maculatus*, de G.	,,
(*o*) *Canadian Wonder Beans.*			
COLEOPTERA.	Bruchidae.	*Bruchus obtectus*, Say.	,,
(*p*) *Imported Carrot Seed.*			
COLEOPTERA.	Anobiidae.	*Lasioderma serricorne*, F.	,,
(*q*) *Ginger.*			
COLEOPTERA.	Anobiidae.	*Lasioderma serricorne*, F.	,,
(*r*) *Dried Bananas.*			
COLEOPTERA.	Cucujidae.	*Oryzaephilus surinamensis*, L.	,,

(*s*) *Flour.*

COLEOPTERA.	Tenebrionidae.	*Tribolium castaneum*, Herbst.	A. and L.
COLEOPTERA.	Trogositidae.	*Tenebroides mauritanicus*, L.	,,

(*t*) *Imported Dried Fish.*

COLEOPTERA.	Cleridae.	*Necrobia rifipes*, de G.	,,
COLEOPTERA.	Dermestidae.	*Dermestes ater*, de G.	,,
COLEOPTERA.	Dermestidae.	*D. maculatus*, de G.	,,

CHAPTER IV

LIST OF INSECT PESTS AND THEIR FOOD-PLANTS

I.—COLEOPTERA (beetles)

	Family : Anobiidae.
Lasioderma serricorne, F.	Stored Cocoa beans, stored Tobacco leaf, imported Carrot seed, stored Ginger, cigarettes, cigars.
	Family : Anthribidae.
Araecerus fasciculatus, de Geer.	Cacao, Lima beans, Cauliflower, stored Cocoa beans, stored Yams, stored Maize cobs.
Phloeobius catenatus insignis, Jord.	Seedling Cacao plants.
	Family : Bostrychidae.
Apate monacha, F.	Cacao, Orange (stem-borer).
Dinoderus minutus, F.	Cassava starch.
Rhizopertha dominica, F.	Stored Grain.
	Family : Bruchidae.
Bruchus analis, F.	Stored Cowpeas.
B. obtectus, Say.	Stored Canadian Wonder beans.
B. phaseoli, Gyll., var.	Stored Bambara Groundnuts.
Pachymerus lacerdae, Chev.	Oil Palm nuts.
P. longus, Pic.	Stored Ground Nuts, stored seeds of *Prosopsis africana* and *Tamarindus indica*.
	Family : Buprestidae.
Agrilus capensis, Murray.	Cotton, *Hibiscus rosa-sinensis*.
Pseudagrilus leonensis, Kerr.	Garden Egg.
P. sophorae, F.	Cotton, *Urena lobata*, Okra, Roselle, *Hibiscus rosa-sinensis*, *H. rostellatus*, *H. vitifolius*, *Abutilon mauritianum*, *Sida carpinifolia*, *Triumfetta rhomboidea*.
Sphenoptera gossypii, Cotes.	Cotton (roots).
	Family : Cassididae.
Aspidomorpha chlorina, Boh.	Cotton.
A. confinis, Klug.	*Urena lobata*.
A. isparetta, Boh.	Cotton, *Quamoclit coccinea*.
	Family : Cetoniidae.
Diplognatha gagates, F.	Cotton, Garden Egg, Sour-sop, *Abutilon mauritianum*, Logwood, *Vernonia tenoreana*.
Glycyphana sanguinolenta, Oliv.	*Tephrosia candida*, Logwood.
Heterorrhina suturalis, F.	Mango, Cashew.
Incala schoutedeni, Moser.	Sweet Orange, Mango.
Pachnoda cordata, Drury.	Cotton, Garden Egg, Citrus, Mango, Cashew, Rose, Logwood, *Vernonia tenoreana*.
P. interrupta, F.	Bulrush Millet, *Abutilon sp*.
P. marginella, F.	Sweet Orange, Mango, Larvae in rotten trunk of Oil Palm.
Plaesiorrhina recurva, F.	Mango, Cashew.

Platygenia barbata, Afzel.	Oil Palm.
	Family : Chrysomelidae.
Plagiodera circumcincta, Sahlb.	Cotton.
	Family : Cleridae.
Necrobia rufipes, de G.	Palm kernels (stored), imported dried Fish, imported Copra.
	Family : Coccinellidae.
Epilachna chrysomelina, F.	'Egusi,' *Lagenaris vulgaris*.
E. similis, Thunb., var. *assimilis*, Muls.	Maize, Cotton, *Urena lobata*, grass.
	Family : Crioceridae.
Crioceris livida, Dalm.	Yams.
	Family : Cryptocephalidae.
Cryptocephalus bifasciatus, F.	Cotton.
C. obesus, Suff.	"
C. simplex, Suff.	"
C. w-nigrum, Suff.	"
	Family : Cucujidae.
Laemophloeus pusillus, Schön.	Stored Grain.
Oryzaephilus mercator, Fauv.	Palm kernels (stored).
O. surinamensis, L.	Dried Bananas.
	Family : Curculionidae.
Apoderus fuscicornis, Oliv.	Guava, *Paullinia pinnata*, *Quisqualis indica*.
Balanogastris kolae, Desbr.	Kola nuts (on tree and in store).
Calandra oryzae, L.	Maize, stored Grain.
Cylas brunneus, F.	Sweet Potato, also stored tubers.
C. puncticollis, Boh.	Sweet Potato, also stored tubers.
Isaniris thomsoni, Fst.	Cacao.
Mitophorus acerbus, Fst.	Bulrush Millet, Ground Nut, Bengal Bean, Cotton, *Urena lobata*, Beniseed, Spinach.
Paremydica insperata, Fst.	Kola nuts (on tree and in store).
Piezotrachelus pullus, Boh.	Cowpea seeds in field and store.
Rhynchophorus phoenicis, F.	Oil Palm, Coconut Palm.
Siderodactylus sagittarius, Oliv.	Bulrush Millet, Cotton, Beniseed, Spinach.
Temnoschoita quadripustulata, F.	Oil Palm.
	Family : Dermestidae.
Dermestes ater, de G.	Imported Copra, imported dried Fish.
D. maculatus, de G.	Palm kernels (stored), Tobacco leaf (stored), imported dried Fish.
	Family : Dynastidae.
Heteroligus appius, Burm.	Yams.
H. claudius, Klug.	Yams.
Oryctes erebus, Burm.	Oil Palm.
O. monoceros, Oliv.	Date Palm.
O. owariensis, P. de B.	Oil Palm.
	Family : Eumolpidae.
Eryxia holosericea, Klug.	Cotton.
Eurydemus gossypii, Bryant.	"

Pagria gossypii, Bryant.	Cotton.
Syagrus calcaratus, F.	Cotton, Okra.
	Family : Galerucidae.
Barombia humeralis, Laboiss.	Ground Nut, Lima Bean, Soya Bean, Bengal Bean, Lablab Bean, Cotton, *Desmodium velutinum*.
Monolepta lineata, Karsch.	Lima Bean, French Beans.
Ootheca mutabilis, Sahlb.	Coffee, Cowpea, Soya Bean, Bengal Bean, Lablab Bean, Sword Bean, Cotton, *Lonchocarpus cyanescens*.
	Family : Halticidae.
Haltica punctata, All.	Cotton.
Podagrica dilecta, Dalm.	Cotton, Hemp-leaved Hibiscus, *Urena lobata*, Long-fruited Jute, Okra, Roselle, *Hibiscus mutabilis*, *H. rostellatus*, *Sida rhombifolia*, *Triumfetta rhomboidea*.
P. spadicea, Dalm.	Cotton, Hemp-leaved Hibiscus, *Urena lobata*, Okra, Roselle, *Hibiscus rosa-sinensis*, *H. rostellatus*, *Triumfetta cordifolia*, var. *hollandii*, *T. rhomboidea*, *Mucuna urens*.
P. uniforma, Jac.	Cotton, Hemp-leaved Hibiscus, *Urena lobata*, Long-fruited Jute, Okra, Roselle, *Abutilon mauritianum*, *Hibiscus mutabilis*, *H. rosa-sinensis*, *H. rostellatus*, *Wissadula rostrata*.
	Family : Hispidae.
Coelaenomenodera elaeidis, Maulik.	Oil Palm.
Hispa spinulosa, Schönh.	Maize, grass.
Platypria luctuosa, Chap.	Bengal Bean.
Trichispa sericea, Guér.	Rice.
	Family : Lagriidae.
Lagria villosa, F.	Yams, Cowpea, Cotton, Maize.
L. viridipennis, F.	Yams, Cowpea, Cotton, Maize, the Castor plant.
	Family : Lamiidae.
Dichostates collaris, Chev.	Pigeon Pea.
?Phosphorus sp.	Kola (stem-borer).
	Family : Lycidae.
Cautires dilucidus, Kln.	Citrus.
	Family : Melöidae.
Cylindrothorax westermanni, Mäkl.	Rice, Maize (male flowers).
Decapotoma affinis, Oliv.	Ground Nut, Cotton, grass.
Mylabris bifasciata, Oliv.	Cowpea, Green Gram.
	Family : Melolonthidae.
Pseudotrochalus concolor, Kolbe.	Maize, Cotton, Lemon, Lime, Logwood, *Spondias Monbin*, *Quisqualis indica*, *Bixa orellana*.
Trochalus carinatus, Schönh.	Cacao.
	Family : Melyridae.
Melyris abdominalis, F.	Bulrush Millet.
M. longipilis, Pic.	Bulrush Millet.
	Family : Nitidulidae.
Carpophilus humeralis, F.	Pineapple.
	Family : Rutelidae.
Adoretus umbrosus, F.	Cacao, Kola.

	Family : Scolytidae.
Coccotrypes pygmaeus, Eich.	Oil Palm, Cacao.
Cryphalus hampei, Ferr.	Coffee, Lima Bean.
	Family : Tenebrionidae.
Alphitobius laevigatus, F.	Stored Cottonseed.
Tribolium castaneum, Herbst.	Maize (in field), stored Cocoa beans, Shea nuts (in store), stored Grain, stored Ground Nuts, Flour.
	Family : Trogositidae.
Tenebroides mauritanicus, L.	Stored Grain, stored Ground Nuts, Flour.
	II.—DIPTERA (flies).
	Family : Chloropidae.
Epimadiza gallicola, Séguy.	Cotton.
	Family : Muscidae.
Atherigona excisa, Thoms.	Finger Millet, Cabbage, Tomato.
	Family : Stratiomyiidae.
Hermetia pennicornis, Bezzi.	Oil Palm.
	Family : Trypetidae.
Ceratitis colae, Silv.	Kola.
C. nigerrima, Bezzi.	Coffee, Pitanga Cherry.
Pardalaspis punctata, Wied.	Cacao.
Pterandrus anonae, Graham.	Sour-sop, Guava.
	III.—HYMENOPTERA (ants).
	Family : Formicidae.
Messor barbara, L.	Cotton (seedlings).
	IV.—ISOPTERA (termites).
	Family : Termitidae.
Amitermes evuncifer, Silv., var. *heterocera*, Silv.	Citrus.
	V.—LEPIDOPTERA (butterflies and moths).
	Family : Arctiidae.
Amsacta flavicosta, Hmps.	Cotton.
Diacrisia curvilinea, Walk.	Cacao.
D. lutescens, Wlk.	Yams, Maize, Lablab Bean.
D. maculosa, Cram.	Cacao, Cotton, Onions.
D. occidens, Roths.	Bengal Bean, Lablab Bean.
	Family : Cosmopterygidae.
Pyroderces coriacella, Snell.	Cotton.
P. simplex, Wlsm.	Cotton.
	Family : Drepanidae.
Epicampoptera glauca, Hmps.	Coffee.
	Family : Eucosmidae.
Argyroploce leucotreta, Meyr.	Kola, Maize, Lima Bean, Cotton, Tangerine, Guava.
Laspeyresia ptychora, Meyr.	Lima Bean.
	Family : Eupterotidae.
Phiala hologramma, Aur.	Cacao.
	Family : Gelechiidae.
Mometa zemoides, Durr.	Cotton.
Platyedra gossypiella, Saund.	Cotton, Okra, stored Cottonseed.

Sitotroga cerealella, Ol.	Stored Grain.
	Family : Geometridae
Alcis acaciaria, Boisd.	Cotton.
A. divisiaria, Walk.	Cacao.
Nemoria stibolepida, Butl.	Cotton.
	Family : Gracilariidae
Acrocercops bifasciata, Wlsm.	Cotton (leaf-miner).
A. chalybophanes, Meyr.	Coffee (leaf-miner).
	Family : Hesperiidae.
Pteiroteinon laufella, Hew.	Oil Palm (leaf-roller).
Rhopalocampta forestan, Cram.	Cacao, Kohl Rabi.
Tagiades flesus, F.	Yams.
	Family : Lasiocampidae.
Gonometa nysa, Druce.	Mango.
G. subfascia, Wlk.	Mango, Orange.
Leipoxais rufobrunnea, Strand.	The Castor Plant.
L. siccifolia, Auriv.	Cotton.
	Family : Limacodidae.
Parasa infuscata, Wied.	Cotton.
P. viridissima, Holl.	Cacao, Kola, *Hura crepitans*.
Thosea pepon, Karsch.	Coffee.
	Family : Lycaenidae.
Euchrysops malathana, Boisd.	Cowpea.
Lampides boeticus, L.	Pigeon Pea, Cowpea.
Virachola antalus, Hopff.	Lima Bean, Cowpea.
	Family : Lymantriidae.
Dasychira carpenteri, B. Bkr.	Shea Butter tree.
D. georgiana, Fawc.	Ground Nut, Lima Bean.
D. proleprota, Hmps.	Shea Butter tree, *Cola acuminata*.
E. lyonia, Swinth.	Cotton.
Euproctis fasciata, Walk.	Cotton.
Orgyia niobe, Weym.	Okra.
	Family : Lyonetiidae.
Bucculatrix loxoptila,Meyr.	Cotton.
Plemyristis oenochares, Meyr.	Cotton, Lima Bean.
	Family : Megalopygidae.
Eulophonotus myrmeleon, Feld.	Cacao (stem-borer).
	Family : Noctuidae.
Achaea boris, Gey.	Citrus (Fruit-piercing moth).
A. catella, Guen.	Citrus (Fruit-piercing moth).
A. faber, Holl.	Citrus (Fruit-piercing moth), larvae on *Celtis prantlii*.
Achaea lienardi, Boisd.	Citrus, Guava, Tomato, Pitanga Cherry (Fruit-piercing moth), larvae on *Bridelia ferruginea* and *Monodora tenuifolia*.
A. mercatoria, F.	Citrus (Fruit-piercing moth).
A. mormoides, Wlk.	Citrus (Fruit-piercing moth).

Anomis leona, Schaus.	Citrus (Fruit-piercing moth); larvae on Cacao and Kola.
Anua gonoptera, Hmps.	Citrus (Fruit-piercing moth).
Audea endophaea, Hmps.	Citrus (Fruit-piercing moth).
Azazia irrorata, F.	Cowpea.
Busseola fusca, Full.	Maize, Guinea Corn, Bulrush Millet (stem-borer).
Caligatus angasi, Wing.	Citrus (Fruit-piercing moth).
Characoma stictigrapta, Hmps.	Cacao, Kola.
Cirphis loreyi, Dup.	Maize, Guinea Corn.
Cosmophila erosa, Hb.	Cotton, Okra.
C. flava, F.	Cotton, Okra.
Cyligramma limacina, Guen.	Citrus (Fruit-piercing moth).
C. simplex, Grunb.	Banana (Fruit-piercing moth), larvae on *Anona senegalensis*.
Dermaleipa metaphaea, Hmps.	Mango (Fruit-piercing moth).
D. parallelipipeda, Guen.	Citrus (Fruit-piercing moth).
Diparopsis castanea, Hmps.	Cotton (bollworm).
Earias biplaga, Walk.	Cotton (bollworm), Cacao, Okra, *Hibiscus rosa-sinensis*, *Abutilon mauritianum*, *Sterculia tragacantha*, *Sida carpinofolia*.
E. insulana, Boisd.	Cotton (bollworm), *Abutilon mauritianum*.
Heliophisma catocalina, Holl.	Citrus (Fruit-piercing moth).
Heliothis armigera, Hübn.	Cotton (bollworm), Tobacco, Tomato.
Lacera alope, Stoll.	Citrus (Fruit-piercing moth), larvae on Logwood.
Laphygma exempta, Wlk.	Maize (Army worm).
L. frugiperda, S. and A.	Maize (Army worm).
Lophacrama phaenicochlora, Hmps.	Cacao.
Lophotavia incivilis, Wlk.	Mango (Fruit-piercing moth).
Metagarista maenas, H.-Sch.	Yams.
M. triphaenoides, Wlk.	Yams.
Miniodes discolor, Guen.	Citrus (Fruit-piercing moth).
Mocis undata, F.	Citrus (Fruit-piercing moth).
Nagia natalensis, Hmps.	Mango (Fruit-piercing moth).
Othreis divitiosa, Wlk.	Citrus (Fruit-piercing moth).
O. fullonia, Cl.	Citrus (Fruit-piercing moth).
O. materna, L.	Citrus (Fruit-piercing moth).
Phytometra acuta, Walk.	Maize (Army worm), Bengal Bean.
P. chalchites, Esp.	Cotton.
P. rutilifrons, Wlk.	Tobacco.
Plusia acuta, Walk.	Cacao.
P. orichalcea, F.	Kohl Rabi.
Prodenia litura, F.	Cotton (bollworm), Cacao, Maize, Cowpea, Tobacco, Garden Egg, Spinach, Tomato, Cabbage.
Sesamia calamistis, Hmps.	Maize, Guinea Corn (stem-borer).
Sphingomorpha chlorea, Cram.	Citrus (Fruit-piercing moth).
Spodoptera mauritia, Boisd.	Maize (Army worm).
Xanthodes graellsii, Feisth.	Cotton, Okra.

NOTE.—Nearly all the Citrus-piercing moths also attack Mango.

	Family : Nymphalidae.
Acraea terpsichore, L.	Long-fruited Jute, *Triumfetta rhomboide* .
Hypolimnas misippus, L.	Spinach.
Leucosticha daedalus, F.	Cotton, *Combretum racemosum*, *Terminalia catappa*.
Precis pelarga, F.	Cacao.
	Family : Papilionidae.
Papilio demodocus, Esp.	Citrus.
P. nireus, L.	Citrus.
	Family : Psychidae.
Clania cervina, Druce.	Cotton.
Metisa sierricola, White.	Cacao, Kola, Ground Nut.
	Family : Pterophoridae.
Marasmarcha atomosa, Wlsm.	Pigeon Pea.
	Family : Pyralidae.
Chilo pyrocaustalis, Hmps.	Bulrush Millet (stem-borer).
Corcyra cephalonica, Staint.	Oil Palm nuts, stored Cocoa beans, stored Grain.
Crocidoloma binotalis, Zell.	Turnip, Kohl Rabi.
Culladia inconspicuella, Snell.	Stored Cocoa beans.
Eldana saccharina, Walk.	Maize, Guinea Corn (stem-borer).
Ephestia cautella, Wlk.	Palm kernels, stored Cocoa beans, stored Grain, stored Ground nuts, stored Cottonseed, imported Chocolates.
Etiella zinckenella, Treit.	Lima Bean, *Crotalaria sp.*
Hellula undalis, F.	Cabbage, Turnips.
Hymenia fascialis, Cram.	Beetroot.
Lamprosema indicata, F.	Lima Bean.
L. niphealis, Wlk.	Lima Bean.
L. peonalis, Wlk.	Lima Bean.
Maruca testulalis, Hb.	Cowpea.
Mussidia nigrinervella, Rag.	Cacao, Maize (in field and store), Lima Bean, Cotton (bollworm).
Pimelephila ghesquierei, Tams.	Oil Palm.
Plodia interpunctella, Hb.	Stored Cowpeas, stored Grain.
Sylepta derogata, F.	Kola, Cotton (leaf-roller), Okra.
S. polycymalis, Hmps.	Kola.
S. retractalis, Hmps.	Cacao, *Deinbollia pinnat* ..
S. semilugens, Hmps.	Kola.
Thliptoceras octoguttale, Feld.	Coffee.
Zebronia phenice, Cram.	Cotton (leaf-roller), Okra, *Newbouldia laevis*
	Family : Saturniidae.
Bunaea alcinoë, Cram.	Cassava.
B. rhodophila, Wlk.	Bengal Bean, Grapefruit.
Cirina butyrospermi, Vuillet.	Shea Butter tree.
	Family : Satyridae.
Melanitis leda ismene, Cram.	Grapefruit (Fruit-piercer .
	Family : Sphingidae.
Acherontia atropos, L.	Garden Egg.

Herse convlvuli, L.	Sweet Potato.
Polyptychus carteri, Butl.	Kola.
P. poliades, Jord.	Kola.
	Family : Tineidae.
Gnorimoschema heliopa, Low.	Tobacco (borer).
Setomorpha rutella, Zell.	Tobacco (seeds).
	Family : Tortricidae.
Cacoecia occidentalis, Wals.	Cotton.

VI.—ORTHOPTERA (grasshoppers and crickets

	Family : Acrididae.
Acanthacris ruficornis citrina, Serv.	Guinea Corn, Cotton.
Acrida sulphuripennis, St.	Maize.
Acrotylus blondeli, Sauss.	Bulrush Millet.
Atractomorpha gerstaeckeri, I. Bol.	Spinach.
Catantops axillaris, Thnbg.	Cotton, Okra.
C. melanostictus, Schaum.	Tobacco, Cabbage, Zinnia, *Bryophyllum pinnatum*.
C. simplex, Uv.	Cacao, *Solanum verbascifolium*.
C. spissus, Wlk.	Cacao, *Tephrosia candida*, Canna, Zinnia, Acalypha, *Aspilia latifolia*.
Cyrtacanthacris aeruginosa unicolor, Uv.	Cotton, Okra, Garden Egg, *Aspilia latifolia*.
Heteropternis thoracica, Wlk.	Bulrush Millet.
Hieroglyphus daganensis, Kr.	Bulrush Millet.
Kraussaria angulifera, Kr.	Bulrush Millet.
Locusta migratoria migratorioides, R. and F.	Oil Palm, Maize, Guinea Corn, Bulrush Millet, Rice, Pineapple, Banana, Bamboo.
Morphacris fasciata, Thnbg., ab. *sulcata*, Thnbg.	Maize, Bulrush Millet.
Nomadacris septemfasciata, Serv.	Maize, Bulrush Millet, Guinea Corn.
Oedaleus nigeriensis, Uv.	Bulrush Millet.
O. senegalensis, Kr.	Cotton.
Oxya hyla minor, Sjöst.	Rice.
Phymateus karschi, Bol.	Cotton, Potato, *Thevetia neriifolia*.
Pyrgomorpha kraussi, Uv.	Turnips.
Rhytidacris tectifera, Karsch.	Citrus.
Rutidoderes squarrosus, L.	*Tephrosia candida*, Citrus.
Spathosternum pygmaeum, Karsch.	Maize.
Stenocrobylus festivus, Karsch.	Mango, Guava, Salvia, *Ficus capensis*.
Zonocerus variegatus, L.	Cacao, Kola, Yams, Cassava, Maize, Cowpea, Soya Bean, Cotton, Pumpkins, Banana, Hevea rubber, Acalypha, *Solanum verbascifolium*.
	Family : Gryllidae.
Brachytrypes membranaceus, Drury.	Vegetables (seedlings).
Gryllotalpa africana, P. de B.	Rice (seedlings).

VII.—RHYNCHOTA (plant bugs).

	Family : Aleurodidae.
Aleuromarginatus tephrosiae, Corb.	*Tephrosia candida*.
Bemisia sp.	Tobacco (vector of Leaf Curl).
B. goldingi, Corb.	Cotton (vector of Leaf Curl).
B. nigeriensis, Corb.	Cassava (vector of Mosaic).
	Family : Aphididae.
Aphis gossypii, Glov.	Cotton, Water Melon.
A. laburni, Kalt.	Ground Nut (vector of Rosette), Lima Bean.
Myzus persicae, Sulz.	Beniseed.
	Family : Capsidae.
Distantiella theobroma, Dist.	Cacao, Citrus.
Halticus tibialis, Reut.	Sweet Potato, Ground Nut, Lima Bean, Soya Bean, Cowpea, Cotton, Okra, Calopogonium, *Triumfetta rhomboidea*.
Helopeltis bergrothi, Reut.	Cacao, *Solanum verbascifolium*.
H. sanguineus, Popp.	The Castor Plant, Pigeon Pea, Cowpea, Bengal Bean, Cotton, Mango, Guava, Cashew, *Spondias Monbin*, Panax, Acalypha, *Paullinia pinnata*, *Solanum torvum*, *S. verbascifolium*, *Jussiaea linifolia*, *Lagerostroemia flosreginae*, *Combretum racemosum*.
H. westwoodi, White.	Cacao, *Solanum verbascifolium*.
Proboscidocoris fuliginosus, Reut.	Cowpea.
Sahlbergella singularis, Hagl.	Cacao.
	Family : Cercopidae.
Locris maculata, F.	Rice, grass.
Ptyelus grossus, F.	The Castor Plant, Pigeon Pea, *Tephrosia candida*, Yams, Grapefruit, *Abutilon mauritianum*, *Acacia farnesiana*.
	Family : Coccidae.
Aspidiotus destructor, Sign.	Oil Palm, Coconut Palm, Banana, Yams.
Ceronema africana, Macfie.	Ground Nut, Pigeon Pea.
Dactylopius longispinus, Targ.	Cacao.
Ferrisiana virgata, Ckll.	Ground Nut.
Hemichionaspis minor, Maskell.	Cotton, *Urena lobata*, Okra.
Lecanium inopheron, Laing.	Cotton.
Palaeococcus cajani, Newst.	Pigeon Pea.
Pseudococcus brevipes, Ckll.	Pineapple.
P. njalensis, Laing.	Cacao (vector of Swollen Shoot).
P. virgatus, var. *madagascariensis*, Newst.	Cacao.
Pulvinaria jacksoni, Newst.	Cotton.
Stictococcus dimorphus, Newst.	Cacao, Pigeon Pea.
S. sjöstedti, Newst.	Cacao.
	Family : Coreidae.
Acanthocoris dentatus, Hagl.	Cacao.
Acanthomyia horrida, Germ.	Cowpea.

A. tomentosicollis, Stål.	Cowpea, Cotton.
Anoplocnemis curvipes, F.	Cowpea, Cotton, Lablab Bean, Sword Bean, Okra, Citrus, Zinnia, *Vernonia amygdalina*, *Gliricidia maculata*.
A. tristator, F.	Mango, Logwood, *Lonchocarpus cyanescens*, *Paullinia pinnata*.
Clavigralla gibbosa, Spin.	Lablab Bean.
Cletomorpha lancigera, F.	Cacao.
Cletus fuscescens, Walk.	Spinach, *Solanum verbascifolium*.
Leptocorisa apicalis, Westw.	Rice, grass.
Leptoglossus membranaceus, F.	'Egusi', Cucumber, Snake Gourd, Citrus, Mango, *Passiflora foetida*, *Momordica charantia*, *M. foetida*.
Mirperus torridus, Westw.	Guinea Corn, Bulrush Millet, Rice, Cowpea, Cotton, Roselle, *Desmodium velutinum*, *Uraria picta*.
Plectrocnemia oblongipes, F.	Mango.
Riptortus dentipes, F.	Rice, Cowpea, *Tephrosia candida*, *Desmodium mauritianum*.
R. tenuicornis, Dall.	Sword Bean, Citrus, Pitanga Cherry, *Cassia occidentalis*, *Desmodium mauritianum*.
Theraptus devastans, Dist.	Mango, *Caesalpinia pulcherrima*.
Pundaluoya simplicia, Dist.	Family : Delphacidae.
Sogata furcifera, Horv.	Kola.
	Maize.
Dictyopharina serene, Stål.	Family : Dictyopharidae.
	Coffee.
	Family : Jassidae.
Cicadulina sp., nr. *arachidis*, China.	Maize.
Cicadulina sp., nr. *storeyi*, China.	Maize.
Empoasca dolichi, Paoli.	Lablab Bean.
E. facialis, Jac.	Cotton.
	Family : Lygaeidae.
Aphanus littoralis, Dist.	Groundnuts (stored).
Chauliops rutherfordi, Dist.	Cowpea, Lablab Bean, Cotton, Calopogonium, *Desmodium mauritianum*.
Graptostethus rufus, F.	*Tephrosia candida*.
G. servus, F.	Jute, Long-fruited Jute.
Lygaeus rivularis, Germ.	Guinea Corn, Bulrush Millet.
Oxycarenus dudgeoni, Dist.	Cotton, Jute, Okra, *Hibiscus rostellatus*.
O. gossypinus, Dist.	Cotton, Jute, Okra, *Sida carpinifolia*, *Abutilon mauritianum*, *Hibiscus vitifolius*.
Paromius gracilis, Ramb.	Finger Millet.
	Family : Pentatomidae.
Acrosternum acutum, Dall.	Bulrush Millet, Cotton.
A. punctato-rugosum, St.	Grapefruit.
Aethemenes chloris, Westw.	Guinea Corn, Cotton.
Agonoscelis versicolor, F.	Bulrush Millet, Cotton, Beniseed, *Leucas martinicensis*.
Antestia lineaticollis, St.	Coffee.
Aspavia acuminata, Mont.	Bulrush Millet, Finger Millet.

Aspavia armigera, F.	Rice, Cowpea, Cotton, *Sesamum radiatum*, grass, *Desmodium mauritianum.*
A. hastator, F.	Rice, grass, *Solanum verbascifolium*, *Eleusine indica.*
Atelocera raptoria, Germ.	Cacao, Cotton, Mango, *Casuarina equisetifolia*, *Vernonia tenoreana.*
Bathycoelia thalassina, P.B.	Cacao, Orange.
Caura pugillator, F.	The Castor Plant, Orange.
Durmia haedula, St.	Finger Millet.
Halydicoris scoruba, Dall.	Maize, Guinea Corn, Bulrush Millet, Cowpea, Cotton.
Halyomorpha annulicornis, Sign.	Cowpea, *Tephrosia candida*, *Sesamum radiatum*, *Duranta plumieri.*
H. reflexa, Sign.	Cacao.
Hotea subfasciata, Westw.	Cotton, *Urena lobata*, *Hibiscus vitifolius*, *Sida carpinifolia*, *S. rhombifolia*, *Abutilon mauritianum.*
Mecosoma mensor, Germ.	Cotton.
Nezara viridula, L.	Cotton, Guinea Corn, Bulrush Millet, Lima Bean, Cowpea, Benagl Bean, *Sesamum radiatum*, *Crotalaria anagyroides.*
Phricodus hystrix, Germ.	Beniseed.
Piezodorus pallescens, Germ.	Bulrush Millet, Cotton.
Piezosternum fallax, F.	Cacao, *Solanum verbascifolium*, *Momordica sp.*
Platynopus rostratus, Dru.	Garden Egg.
Steganocerus multipunctatus, Thnbg., var. *argus*, F.	Cotton.
Veterna mimica, Dist.	Beniseed.
	Family : Plataspidae.
Coptosoma marginella, Dall.	Pigeon Pea, Soya Bean, Bengal Bean, Lablab Bean, *Tephrosia candida*, *Gliricidia maculata*, *Desmodium mauritianum*, *Crotalaria retusa.*
C. nubila, Germ.	Maize, Pigeon Pea.
	Family : Psyllidae.
Mesohomotoma tessmanni, Aulm., var.	Cacao, Kola.
	Family : Pyrrhocoridae.
Dysdercus fasciatus, Sign.	Cotton, *Adansonia digitata.*
D. haemorrhoidalis, Sign.	Cotton, *Bombax buonopozense*, *Hibiscus rosa-sinensis*, *Abutilon mauritianum.*
D. melanoderes, Karsch.	Cotton, Okra, Roselle, *Bombax buonopozense*, *Hibiscus rosa-sinensis*, *H. vitifolius*, *Abutilon mauritianum.*
D. nigrofasciatus, Stål.	Cotton.
D. superstitiosus, F.	Maize, Guinea Corn, Bulrush Millet, Cotton, Hemp-leaved Hibiscus, *Urena lobata*, Okra, Roselle, Mango, *Ceiba pentandra*, *Adansonia digitata*, *Bombax buonopozense*, *Abutilon mauritianum*, *Sida carpinifolia*, *S. rhombifolia*, *Triumfetta rhomboidea*, *Sterculia Tragacantha*, *Hibiscus rosa-sinensis*, *H. rostellatus*, *H. vitifolius.*
	Family : Ricaniidae.
Pochazia fasciata, F.	Cacao.

Ricanopsis nebulosa, F.	Citrus.
Ricanula detersa, Mel.	Citrus.

Family : Tettigometridae.

Hilda undata, Wlk.	*Tephrosia candida*, Citrus.

VIII.—THYSANOPTERA (thrips)

Family : Thripidae.

Machatothrips braueri, Karny, var. *buffai*, Karny.	Cacao.
Physothrips sjöstedti, Trybon.	Cotton (flowers).
Selenothrips rubrocinctus, Giard.	Cacao, Mango, Cashew.

Chapter V

LIST OF BLOOD-SUCKING FLIES

I.—List of blood-sucking flies known to attack livestock in Nigeria.

(*a*) *Family* : *Hippoboscidae.*

Hippobosca maculata, Leach.

(*b*) *Family* : *Muscidae.* (*—also attacks combs of poultry).

Glossina morsitans, Westw., var. *submorsitans*, Newst.	*Lyperosia minuta*, Bez.
G. palpalis, R.D.	**Stomoxys calcitrans*, L.
G. tachinoides, Westw.	**S. nigra*, Macq.

(*c*) *Family* : *Tabanidae.*

Chrysops distinctipennis, Aust.	*Tabanus gratus*, Lw.
Haematopota bullatifrons, Aust.	*T. latipes*, Mcq.
H. decora, Walk.	*T. laverani*, Surc.
H. lacessens, Aust.	*T. par*, Walk.
H. mactans, Aust.	*T. pluto*, Walk.
H. pallidipennis, Aust.	*T. secedens*, Walk.
Hippocentrum versicolor, Aust.	*T. socialis*, Walk.
Tabanus biguttatus, Wied.	*T. subangustus*, Ric.
T. ditaeniatus, Mcq.	*T. taeniola*, P. de B.

II.—List of other Nigerian blood-sucking flies which may attack livestock.

(*a*) *Family* : *Muscidae.*

Glossina caliginea, Aust.	*Glossina pallicera*, Bigot.
G. fusca, Walk.	*G. tabaniformis*, Wstw.
G. haningtoni, Newst. and Evans.	*Stomoxys brunnipes*, Grünb.
G. longipalpis, Wied.	*S. inornata*, Grünb.
G. medicorum, Aust.	*S. omega*, Newst.
G. nigrofusca, Newst.	*S. pallida*, Roub.

(*b*) *Family* : *Tabanidae.*

Chrysops dimidiata, Wulp.	*Haematopota vittatus*, Loew.
C. longicornis, Macq.	*Hippocentrum trimaculatum*, Newst.
C. silacea, Aust.	*Pangonia rüppellii*, Jaenn.
Haematopota beringeri, Aust.	*Rhinomyza stimulans*, Aust.
H. cordigera, Aust.	*Subpangonia grahami*, Aust.
H. exiguicornuta, Edw.	*S. gravoti*, Surc.
H. gracilis, Aust.	*Tabanus africanus*, Gray.
H. hastata, Aust.	*T. albipalpus*, Walk.
H. pallidicornis, Edw.	*T. argenteus*, Surc.
H. pertinens, Aust.	*Tabanus besti*, Surc.
H. puniens, Aust.	*T. billingtoni*, Newst.
H. tenuicrus, Aust.	*T. combustus*, Big.

T. donaldsoni, Carter.
T. fasciatus, F.
T. fuscipes, Ric.
T. kingsleyi, Ric.
T. marmorus, Surc.
T. necopinus, Aust.
T. nyasae, Ric.
T. obscurefumatus, Surc.
T. obscurehirtus, Ric.
T. obscurissimus, Ric.
T. pertinens, Aust.
T. quadrisignatus, Ric.
T. ruficrus, P. de B.
T. sufis, Jaenn.
T. thoracinus, P. de B.
T. triquetrornatus, Carter.
T. variatus, Walk.
T. williamsii, Aust.

CHAPTER VI

BIBLIOGRAPHY: LITERATURE DEALING WITH THE CROP PESTS, TERMITES AND WILD SILKWORMS OF WEST AFRICA

I.—THE OIL PALM

1. Alibert (H.), 1938.—Etudes sur les Insectes parasites du Palmier à huile au Dahomey. *Rev. Bot. appl. Agric. trop.*, 18 *année*, *No.* 207.

2. Frappa (C.), 1933.—Sur *Platygenia barbata* MacLeay, Insecte nuisible au palmier à huile en A.O.F. *Agron. colon. No.* 182.

3. Golding (F. D.), 1944.—Palm Kernel Borer. *S.P. circ. Memor. No.* 34, *Dept. Agric. Nigeria.*

4. Mallamaire (A.), 1934.—Extraits du Rapport de la Station expérimentale du Palmier à huile du la Mé. Année 1933. Etude systématique et biologique des principaux animaux et insectes parasites des plantes cultivées en Côte d'Ivoire.— *Bull. Com. Afric. occ. fr.*, 17 *No.* 3.

5. Mayné (R.), 1921.—Un Insecte nuisible aux Noix Palmistes, contre lequel il y a lieu de prendre des Mesures de Protection.—*Bull. Agric. Congo belge, xii, No.* 3.

6. Mayné (R.), 1932.—Observation sur une pyrale nouvelle nuisible a l'*Elaeis guineensis*, *Pimelephila ghesquierei Tams.—Arch. zool. xiv, No.* 3-4.

7. Vanderyst (H.), 1923 and 24.—Les Insectes parasites sur l'*Elaeis.* Note concernant un Parasite des Noyaux.—*Bull. agric. Congo belge, xvi. No.* 4 and *xv, No.* 1.

8. Wakefield (E. M.), 1920.—Diseases of the Oil Palm in West Africa.—*Bull. Misc. Inform. R. Bot. Gdns. Kew, London. No.* 9.

9. Anon, 1921.—Pests of the Oil Palm in the Portuguese Congo.—*Bull. Imp. Inst., London, xix, No.* 2.

II.—CACAO

10. Box (H. E.), 1943.—Capsid Pests of Cocoa in West Africa. Outline of Present Knowledge and proposed lines of Research.—*Memor. Cocoa Res. Station Tafo, No.* 12.

11. 1944.—The Sahlbergella Menace to Gold Coast Cocoa. *ibid. No.* 9.

12. 1944.—The Cacao Pest situation in West Africa and the Cameroons, with special reference to *Sahlbergella singularis*, Hagl., and *Sahlbergella theobroma*, Dist. (Hemiptera : Capsidae). Report upon a visit to French Togo, Dahomey, Nigeria and the Cameroons during the Dry Season, December, 1943 to March, 1944. *Tech. Bull., W. Afr. Cacao Res. Inst., No.* 1.

13. 1945.—Insect Transmission of the 'Swollen-Shoot' Virus in West African Cacao. *Nature, Vol.* 155, *p.* 608.

14. Bredo (H. J.), 1931.—Contribution a l'étude de *Sahlbergella singularis*, Hagl.—*Bull. agric. Congo. belge, xxii, No.* 1.

15. Cotterell (G. S.), 1926.—Preliminary Study of the Life-History and Habits of *Sahlbergella singularis*, Hagl., and *Sahlbergella theobroma*, Dist.—*Bull. Dept. Agric., Gold Coast, No.* 3.

16. 1926.—The Life-History and Habits, etc., of *Sahlbergella singularis*, Hagl., and *Sahlbergella theobroma*, Dist. *ibid., No.* 7.

17. 1926—A new parasite of *Sahlbergella singularis*, Hagl. *ibid., No.* 7.

18. 1926.—A new parasite of *Heliothrips rubrocincta. ibid., No.* 7.

19. 1927.—The Red-Banded Cacao Thrips, *Heliothrips rubrocinctus*, Giard. *ibid., No.* 13.

20. 1927.—Minor Pests of Cacao. *ibid., No.* 13.

21. 1927.—Pests of Cocoa in the Gold Coast. *Proc. Ist. W. Afr. Agric. Conf.*

22. 1930.—Report on the Occurrence of *Sahlbergella spp.* and other Insect Pests of Cacao in Fernando Póo, San Thomé and the Belgian Congo. *Bull. Dept. Agric. Gold Coast, No.* 22.

23. 1943.—Entomology. *Report cent. Cocoa Res. Station, Tafo,* 1938-42.

24. Golding (F. D.), 1941.—Capsid pests of Cacao in Nigeria.—*Bull. ent. Res., Vol.* 32, Pt. 1.

25. Hall (W. J.), 1945.—The Identity of a Mealybug Vector of " Swollen-Shoot " virus Disease of Cacao in West Africa. *ibid., Vol.* 36, Pt. 3.

26. Laing (F.), 1944.—A new injurious Mealy-bug from the Gold Coast. *ibid., Vol.* 35, Pt. 1.

27. Liégois (P.), 1944.—La culture du cacaoyer au Congo Belge.—*Bull. agr. Congo belge,* 35, *Nos.* 1-4.

28. Mayné (R.), 1917.—Insectes et autres Animaux attaquant le Cacaoyer au Congo Belge.—*Etudes Biologie agricole, No.* 3; *Ministère Colonies, Service Agric., Royaume de Belgique, London.*

29. 1925.—Quelques insectes xylophages ennemis des cacaoyers, au Congo Belge.—*Bull. Cercle zool. congolais* in *Rev. zool. afr., xiii, Pt.* 2.

30. Posnette (A. F.), 1943.—Resistance of *Theobroma cacao* to *Sahlbergella spp.* on the Gold Coast. *Bull. ent. Res., Vol.* 34, *Pt.* 2.

31. Vuillet (J.), 1925.—Note sur un insecte nuisible au cacaoyer dans l'Ouest-Africain *Adoretus hirtellus* Castn. (Rutelidae).—*Bull. Com. Etudes. hist. and sci. Afr. Occid. Fr., viii, No.* 2.

32. Wilkinson (D. S.), 1927.—On Two Parasites from West Africa bred from the Cacao Barksapper (*Sahlbergella*).—*Bull. Ent. Res. xvii, Pt.* 3.

III.—COFFEE

33. Bredo (H. J.), 1939.—Catalogue des principaux insectes et nématodes parasites des caféiers au Congo Belge.—*Bull. agric. Congo belge* 30 *No.* 2.

34. Chevalier (A.), 1931.—Sur un dangereux ennemi du caféier en Guinée française: le borer des rameaux (*Xyleborus morstatti* Haged).—*Rev. Bot. appl. et de l'Agr. trop., XI.*

35. Chevalier (A.) et Dufrenoy (J.), 1931.—Destruction du borer du caféier (*Apata monacha*) par un champignon parasite. *ibid. XI.*

36. Dagron (M.), 1930.—Les borers du caféier au Togo. *ibid. X, Nos.* 108-109.

37. Ghesquière (J.), 1939.—Un capside myrmécoïde nuisible au caféier.—*Bull. Cerc. zool. congol.* 16. in *Rev. zool. Bot. afr.* 33.

38. Leroy (J. V.), 1936.—Observations relatives à quelques insectes attaquant le Caféier. *Publ. I.N.E.A.C., Sér. sci. No.* 8.

39. Leroy (J. V.) *et al,* 1942.—Les *Antestia* spp. au Kivu.—*Publ. Inst. Etude agron. Congo belge Sér. sci. No.* 26.

40. Leroy (J. V.) et Hendrickx (F. L.), 1941.—Contribution à l'étude des dégats causés par les *Antestia* aux caféiers (*Coffea arabica* L.). *Centre afrique, No.* 393.

41. Mallamaire (A.), 1933.—Les Borers du Caféier en Basse Côte d'Ivoire. Le *Monohammus sierricola* White et l'*Apate monachus* F. dangereux parasites des caféiers dans le Sud-Est de la Basse Côte d'Ivoire (Cercle d'Assinie). *Bull. Com. Afr. occid. fr., xv, Nos.* 2-3.

42. 1935.—*Bixadus* (*Monohammus*) *sierricola* White. Longicorne nuisible au caféier en Côte d'Ivoire. *Rev. Path. veg.* 22.

43. 1937.—Les principaux nématodes, myriapodes et insectes parasites des caféiers cultivés dans l'Ouest Africain français.—*Ann. agric. Afr. occ. I, No.* 1.

44. Mancion (J.) and Alibert (H.), 1936.—La production du café au Togo (cercles de Klouto et d'Atakpame) et quelques insectes déprédateurs du caféier. *Agron. colon. No.* 224.

45. Mayné (R.), 1923.—Principaux ennemis des caféiers au Congo belge.—*Ann. Gembloux xxix, No.* 12.

46. Pascalet (P.), 1939.—La lutte biologique contre *Stephanoderes hampei* ou scolyte du caféier au Cameroun.—*Rev. Bot. appl.* 19, *No.* 219.

47. Steyaert (R. L.), 1935.—Un ennemi naturel du *Stephanoderes* Le *Beauveria bassiana* (Bals.) Vuill. *Publ. I.N.E.A.C., Sér. sci. No.* 2.

IV.—SHEA BUTTER TREE

48. Golding (F. D.), 1929.—Preliminary notes on a pest of the Shea Tree in Northern Nigeria. *8th Ann. Bull. Agric. Dept., Nigeria.*

V.—ROOT CROPS

49. Golding (F. D.), 1928.—Notes on the yam pest, *Heteroligus claudius*, Klug., in the Benin and Warri Provinces of Nigeria. *7th Ann. Bull. Agric. Dept., Nigeria.*

50. Lean (O. B.), 1928.—A Dynastid beetle as a serious pest of Yams in the Benue Province of Nigeria. *ibid.*

51. 1929.—Experiments on the Life History and Control of the Yam Beetle in the Benue Province of Nigeria. *8th Ann. Bull. Dept. Agric., Nigeria.*

52. Foscolo (E.) and Lefèvre (P. C.), 1939.—Culture et parasites de la patate douce dans l'Ituri.—*Bull. Agric. Congo belge* 30, *No.* 3.

53. Golding (F. D.), 1936.—Cassava Mosaic in Southern Nigeria. *11th Ann. Bull. Agric. Dept., Nigeria.*

54. 1936.—*Bemisia nigeriensis*, Corb., a vector of cassava Mosaic in Southern Nigeria. *Trop. Agric. Vol. XIII, No.* 7.

55. Lefèvre (P. C.), 1944.—Note sur quelques insectes parasites de *Manihot utilissima*, Pohl. dans la région de Kasenyi (Lac Albert). *Bull. Agric. Congo belge*, 35, *Nos.* 1-4.

VI.—CEREAL CROPS

56. Jemmett (C. W.), 1910.—Preliminary Report on Insects affecting Maize in Southern Nigeria. *Issued by Government of Southern Nigeria.*

57. Lefèvre (P.), 1935.—Etude sur *Busseola fusca* Hmpsn. parasite du maïs.—*Bull Agric. Congo belge* 26, *No.* 4.

58. Vuillet (J.) et Vuillet (A.), 1914.—Les Pucerons du Sorgho au Soudan Français. *Agron. colon. I, Nos.* 11-12; *II, No.* 13.

VII.—GROUND NUT

59. Bouffil (F.), 1933.—Contribution à l'étude de deux maladies de l'arachide.—*Bull. Com. Étude hist. sci. A.O.F.* 16, *No.* 1.

60. Chevalier (A.), 1931.—Sur l'extension et la propagation de la maladie de la rosette de l'arachide au Sénégal. *C.R. Acad. Sci. Fr. cxciii, No.* 22.

61. Risbec (J.), 1941.—Les Insectes de l'Arachide. *Trav. de lab. ent. du Secteur Soudanais de recherches agron.*

62. Roubaud (E.), 1916.—Les Insectes et la Dégénérescence des Arachides au Sénégal. *L'Ann. et Mém. du Com. d'Etudes hist. et sci. de l'Afrique occ. française.*

63. Soyer (D.), 1939.—La "rosette" de l'arachide. Recherches sur les Vecteurs possibles de la maladie.—*Publ. Inst. Étude agron. Congo belge Sér. sci., No.* 21.

64. Vuillet (J.), 1934.—A propos de la rosette de l'arachide : Contrôle des pucerons par les insectes auxiliares.—*Rev. Bot. Appl.* 14, *No.* 149.

VIII.—COTTON

65. Bredo (H. J.), 1933.—Note sur *Argyroploce leucotreta* Meyr.—*Bull. agric. Congo belge, xxiv, No.* 2.

66. 1936.—Note sur l'hibernation du ver rose au Congo belge (*Pectinophora gossypiella*, Saund.) *ibid.* 27, *No.* 3.

67. Brixhe (A.), 1936.—Le *Dysdercus*, ravageur du cotonnier.—*ibid.* 27, *No.* 4.

68. Cotterell (G. S.), 1928.—Cotton Pests of Southern British Togoland and Trans-Volta District. *Bull. Dept. Agric., Gold Coast, No.* 12.

69. Ghesquière (J.), 1922.—Note au sujet des moyens de lutte à employer contre la chenille des capsules, *Heliothis obsoleta* (bollworm) et les chenilles épineuses, *Earias biplaga, E. insulana* (spiny bollworm). *Bull. Administ. and Commercial Congo belge.*

70. Golding (F. D.), 1925.—A statistical survey of the infestation of *Dysdercus spp.* on Cotton in Nigeria. *4th Ann. Bull. Agric. Dept., Nigeria.*

71. 1925.—Observations on *Syagrus calcaratus*, F. and *Helopeltis bergrothi*, Reut., minor pests of Cotton in Southern Nigeria. *ibid.*

72. 1928.—The control of Cotton Stainers in Southern Nigeria. *The Empire Cotton Growing Review. Vol. V, No.* 2.

73. 1928.—Notes on the bionomics of Cotton Stainers (*Dysdercus*) in Nigeria. *Bull. ent. Res. Vol. XVIII, Pt.* 3.

73*a*. China (W. E.), 1929.—An Addendum to Mr Golding's " Notes on the Bionomics of Cotton Stainers (*Dysdercus*) in Nigeria." *ibid. XX, Pt.* 1.

74. Golding (F. D.), 1928.—A first survey of insect and fungoid incidence on improved Ishan Cotton. *7th Ann. Bull. Agric. Dept., Nigeria.*

75. 1929.—Further surveys of insect and fungoid incidence on improved Ishan Cottons in Nigeria. *ibid. 8th.*

76. 1930.—A vector of Leaf Curl of Cotton in Southern Nigeria. *E. C. G. Rev., Vol. VII No.* 2.

77. 1931.—Cotton pests in Nigeria. *Trop. Agric. Vol. VIII, No.* 2.

78. 1938.—Notes on the Insect Pests of Cotton in Nigeria. *E. C. G. Rev. Vol. XV, No.* 3.,

79. 1945.—The Occurrence of *Platyedra gossypiella*, Saund, in Nigeria. *E. C. G. Rev., Vol. XXII, No.* 1.

80. 1945.—Notes on *Helopeltis sanguineus*, Popp., on Cotton in Nigeria. *Bull. ent. Res. Vol.* 36, *Pt.* 1.

81. Golding (F. D.) and Lean (O. B.), 1927.—Nigerian Insect Pests of Cotton. *Proc. 1st. W. Afr. Agric. Conf.*

82. Golding (F. D.), Lean (O. B.) and Laycock (T.), 1927.—A critical comparison of the factors inhibiting the development of three species of Cotton in Southern Nigeria. *6th Ann. Bull. Agric. Dept., Nigeria.*

83. Henrard (P.), 1937.—Les insectes parasites du cotonnier dans la région de Lisala.—*Bull. agric. Congo belge* 28, *No.* 4.

84. 1939.—Le cycle vital de la teigne du cotonnier au Congo belge.—*Rev. Zool. Bot. afr.* 32.

85. Lean (O. B.), 1924.—Observations on the Life-History of *Helopeltis* on Cotton in Southern Nigeria. *Bull. ent. Res., Vol. XVI, Pt.* 4.

86. 1927.—Comparative Observations on the pests of Cotton at Ilorin, Northern Nigeria. *6th Ann. Bull., Dept. Agric., Nigeria.*

87. 1929.—Comparative Observations on the Pests of Cotton in the Benue Province o Nigeria. *ibid.* 8*th*.

88. Leroy (J. V.), 1936.—Observations relatives à quelques Hémiptères du Cotonnier. *Publ. I.N.E.A.C., Sér. sci. No.* 10.

89. Monteil (L.), 1934.—Les insectes nuisibles au cotonnier en Afrique équatoriale française.—*Agron. colon., No.* 193.

90. Moreau (A. P.), 1933.—Un nouvel ennemi du cotonnier en Afrique équatoriale française *Helopeltis bergrothi*, Reut.—*ibid.* 191.

91. Pomeroy (A. W. J.), 1924.—Further Observations on *Dysdercus superstitiosus*, F. and other insects affecting Cotton in Southern Nigeria. *Bull. ent. Res., Vol. XV, Pt.* 2.

92. 1925.—The Cotton Bollworms of Southern Nigeria. 4*th Ann. Bull. Dept. Agric., Nigeria.*

93. Pomeroy (A. W. J.) and Golding (F. D.), 1923.—Observations on the life histories of the Cotton Stainer Bugs of the genus *Dysdercus*, and on their economic importance in the Southern Provinces of Nigeria. *ibid.* 2*nd.*

94. Pomeroy (A. W. J.) and Lean (O. B.), 1925.—Observations on the extent of the damage caused by Bollworms and Stainers to the Cotton crop in Southern Nigeria. *ibid.* 4*th.*

95. Soyer (D.), 1935.—La chenille enrouleuse des feuilles du cotonnier *Sylepta derogata*, Fab.—*Bull. agric. Congo belge.* 26, *No.* 4.

96. 1942.—Miride du cottonier, *Creontiades pallidus*, Ramb, Capsidae (Miridae).—*Publ. Inst. nat. Etude agron. Congo belge Sér. sci, No.* 29.

97. Vayssière (P.) and Mimeur (J.), 1925.—Les chenilles épineuses du cotonnier (*Earias insulana Boisd., E. biplaga Walk.*) en Afrique occidentale française.—*Agron. colon., No.* 85.

98. 1925.—Les Orthoptères nuisibles au cotonnier et autres cultures en *A.O.F. ibid. No.* 89.

99. 1925.—Les Myriapodes et les Hémiptères nuisibles au cotonnier en Afrique Occidentale Française.—*ibid. No.* 91.

100. 1925.—Les Pyrales du Cotonnier (*Sylepta derogata* F. et *Glyphodes indica* Saund) en Afrique occidentale française.—*ibid. No.* 99.

101. 1926.—Les Insectes nuisibles au Cotonnier en Afrique Occidentale Française. *Bibl. de l'Inst. Nat. d'Agron. colon.*

102. Vrydagh (J. M.), 1936.—Contribution à l'étude de la maladie des chancres des tiges du cotonnier causée par *Helopeltis bergrothi*, Reut.—*Bull. agric. Congo belge.* 27, *No.* 1.

103. 1941.—Etude sur la Biologie de *Dysdercus superstitiosus*, F. (Hemiptera). *Publ. I.N.E.A.C., Sér. sci., No.* 24.

104. 1942.—Etude comparée sur la biologie de *Dysdercus nigrofasciatus*, Stal, et *Dysdercus melanoderes*, Karsch. *ibid. No.* 31.

105. 1944.—Note au sujet de la région cotonniere de Mahagi et essai d'introduction dans l'Uele du parasite du ver rose de la capsule le *Microbracon kirkpatricki*, Wilk. *Bull. agric. Congo belge*, 35, *Nos.* 1-4.

106. Vuillet (J.), 1920.—La larve de la Tige du cotonnier (*Sphenoptera gossypii*, Cotes).—*Bull. Comité Etudes Hist. and Scientif. Afr. Occ. Française, No.* 3.

107. 1924.—La lutte contre les Jassides parasites du Cotonnier au Soudan française.—*Rev Bot. appl. and Agric. colon. IV. Bull.* 39.

IX.—TOBACCO

108. West (J.), 1936.—Leaf Curl of Tobacco in Southern Nigeria. *Trop. Agric., Vol., No.* 9.

X.—VEGETABLES

109. Ghesquière (J.), 1923.—La teigne de la pomme de terre au Congo belge.—*Ann. Gembloux, xxix, No.* 2.

110. 1939.—La teigne des cruciferes au Congo Belge.—*Bull. Cerc. zool. congol.* 16. *in Rev. Zool. Bot. afr.* 33.

111. Hargreaves (E.), 1929.—Garden Pests and Diseases in Sierra Leone. *Pamph. Dept. Agric., Sierra Leone, No.* 14.

XI.—FRUIT TREES

112. Box (H. E.), 1942.—Citrus Moth Investigations. *C.D.F. Publ.*

113. Cotterell (G. S.), 1938.—Citrus Fruit-piercing Moths—Summary of information and progress. *Proc. 3rd W. Afr. Agric. Conf.*

114. Golding (F. D.), 1945.—Fruit-piercing Lepidoptera in Nigeria. *Bull. ent. Res., Vol.* 36, *Pt.* 2.

115. Hargreaves (E.), 1936.—Fruit-piercing Lepidoptera in Sierra Leone. *ibid. Vol.* 27, *Pt.* 4.

116. Silvestri (F.), 1914.—Report of an expedition to Africa in search of the Natural Enemies of Fruit Flies (Trypaneidae). *Bull. Div. ent. Hawaii Bd. of Agric. and For., No.* 3.

117. van Zwaluwenburg (R. H.), 1937.—West African Notes. *The Hawaiian Planters' Record, Vol. XLI, No.* 1.

118. Annet (E.), 1940.—Note sur les dégâts causés aux bananiers par l'*Heteronychus claudius.—Rev. Bot. appl.* 20, *No.* 222.

119. Chevalier (A.), 1937.—Sur un Coleoptère du genre *Heteronychus* causant des dégâts aux bananiers en Guinée française.—*ibid.* 17, *No.* 185.

120. Ghesquière (J.), 1924.—La maladie des bananiers dans le Bas-Congo.—*Bull. agric. Congo belge, xv, No.* 1.

121. 1925.—La maladie du Bananier au Congo belge.—*ibid., xvi, Nos.* 3-4.

XII.—STORED PRODUCTS

122. Corby (H. D. L.), in press. *Aphanus* (Hemiptera; Lygaeidae) in stored Ground-nuts.

123. Cotterell (G. S.), 1934.—Infestation of Stored Cocoa by Weevils (*Araecerus fasciculatus*) and Moth (*Ephestia cautella*). *Bull. Dept. Agric., Gold Coast, No.* 28.

124. Golding (F. D.), 1941.—Two new methods of trapping the Cacao Moth (*Ephestia cautella*). *Bull. ent Res. Vol.* 32, *Pt.* 2.

125. 1942.—Pests of Stored products in Nigeria. *Farm and Forest, Vol. II, No.* 2.

126. Vrydagh (J. M.), 1941.—Les insectes nuisibles aux produits en magasin et les moyens de les combattre.—*Not. phytopath Inst. nat. Etude agron. Congo belge, No.* 3.

XIII.—GENERAL

127. Golding (F. D.), 1927.—Notes on the food-plants and habits of some Southern Nigerian insects. *Bull. ent. Res. Vol. XVIII, Pt.* 1.

128. 1931.—Further notes on the food-plants of Nigerian insects. *ibid. Vol. XXII, Pt.* 2.

129. 1935.—Further notes on the food-plants of Nigerian insects *III*. *ibid. Vol.* 26, *Pt.* 2.

130. 1937.—Further notes on the food-plants of Nigerian insects *IV*. *ibid. Vol.* 28, *Pt.* 1.

131. 1940.—Further notes on the food-plants of Nigerian insects *V*. *ibid. Vol.* 31, *Pt.* 2.

132. In press.—Further notes on the food-plants of Nigerian insects *VI*. *ibid.*

133. 1943.—Major insect pests of Nigerian Crops. *Farm and Forest, Vol. IV, No.* 2.

134. Hargreaves (E.), 1927.—Some Insect Pests of Sierra Leone. *Proc. 1st W. Afr. Agric. Conf.*

135. 1937.—Some Insects and their food-plants in Sierra Leone. *Bull. ent. Res., Vol.* 28, *Pt.* 3.

136. Lamborn (W. A.), 1914.—The Agricultural Pests of the Southern Provinces, Nigeria. *ibid. Vol. V, Pt.* 3.

137. Peacock (A. D.), 1913.—Entomological Pests and Problems of Southern Nigeria. *ibid. Vol. IV, Pt.* 3.

138. Vayssière (P.) and Mimeur (J.), 1925.—Au sujet des pucerons, ennemis du Cotonnier, du Mil et du Sorgho en A.O.F.—*Agron. colon., No.* 88.

139.—Anon, 1943.—Rapport pour les exercices 1940 and 1941.—*Inst. nat. Etude agron. Congo belge.*

XIV.—LOCUSTS AND GRASSHOPPERS

140. Bredo (H. J.), 1936.—Sommaire des observations faites au Congo belge et projet des futures recherches sur les acridiens migrateurs.—*Bull. agric. Congo Belge 27, No. 2.*

141. 1944.—Le problème du criquet pèlerin (*Schistocerca gregaria* Forsk.) au Congo Belge. *ibid.* 35, *Nos.* 1-4.

142. Chevalier (A.), 1932.—Nouvelles Observations sur les Sauterelles du Sahara, du Niger et du Soudan Français. *Rev. Bot. appl. et de l'Agr. trop., Vol. XII, No.* 131.

143. Coleno (P.), 1931.—Contribution a l'étude des acridiens migrateurs du Soudan. *Bull. Com. Etudes hist. sci. Afr. occid. fr., xiv, No.* 3.

144.—Cotterell (G. S.), 1930.—The Occurrence of the Migratory Locust (*Locusta migratoria migratorioides, R. and F.*) in the Gold Coast and its dependencies during 1930. *Bull. Agric. Dept., Gold Coast, No.* 23.

145. Félix (J.), 1935.—Acridiens nuisibles dans la région côtière de la Guinée française *Agron. colon., No.* 212.

146. Golding (F. D.), 1932.—Sodium Fluosilicate as a poison against the hoppers of *Locusta migratoria migratorioides, R. and F.*, in Nigeria. *Bull. ent. Res., Vol. XXIII,* 4.

147. 1934.—On the Ecology of Acrididae near Lake Chad. *ibid. Vol. XXV, Pt.* 2.

148. 1934.—Locusts in Nigeria. *Trop. Agric. Vol. XI, No.* 12.

149. 1940.—Notes on the variegated grasshopper, *Zonocerus variegatus*, L., in Nigeria. *Bull. ent. Res., Vol.* 30, *Pt.* 4.

150. 1941.—Locusts. *Farm and Forest, Vol. II, No.* 3.

151. Hargreaves (E.), 1927.—Sierra Leone: The Locust, *Zonocerus variegatus*, L.—*Internat. Rev. Sci. and Pract. Agric., XVIII, No.* 4.

152. Lean (O. B.), 1931.—On the recent Swarming of *Locusta migratorioides*, R. and F. *Bull. ent. Res., Vol. XXII, Pt.* 3.

153. 1931.—The Effect of Climate on the Migrations and Breeding of *Locusta migratorioides* in Nigeria. *ibid. Vol. XXII, Pt.* 4.

154. 1931.—Notes on the Breeding of *Nomadacris septemfasciata* (Orth., Acrid.) on the Shores of Lake Chad. *ibid. Vol. XXII, Pt.* 4.

155. 1936.—*Locusta migratoria migratorioides*, R. and F.: An Ecological Reconnaissance of the suspected Middle Niger outbreak area. *ibid. Vol.* 27, *Pt.* 1.

156. Murat (M.), 1939.—Recherches sur le criquet pèlerin (*Schistocerca gregaria*, Forsk, Acrididae) en Mauritanie Occidentale (A.O.F.) et au Sahara Espagnol, années 1937 et 1938. *Bull. Soc. Hist. nat. Afr. N.* 30.

157. Vayssière (P.), 1931.—Quelques Observations sur les Acridiens migrateurs. *C.R. Acad. Sci. Fr., cxciii, No.* 5.

158. Vrydagh (J. M.), 1932.—Les invasions de criquets migrateurs dans la Province Orientale.—*Bull. agric. Congo belge, xxiii, No.* 2.

159. Zolotarevsky (B. N.), 1934.—Invasions des Acridiens en Guinée Française. *Bull. de la Soc. d'Hist. Nat. de l'Afr. du Nord, Tome vingtcinquième.*

160. 1936.—Compte-rendu sommaire sur les recherches de la Mission d'Etudes de la Biologie des Acridiens dans la région du Tchad en 1935. *ibid. XXVII, No.* 9.

161. 1938.—Recherches sur les foyers grégarigènes du Criquet migrateur africain (*Locusta migratoria migratorioides*, Rch. et Frm. Orth.). *ibid. XXIX, Nos.* 3-4.

162. 1939.—Le criquet nomade (*Nomadacris septemfasciata*, Serv.) en Afrique française. *ibid.* 30, *No.* 2.

163. 1939.—Pullulation du criquet nomade en Afrique occidentale française. *Agron. colon., No.* 257.

164. 1945.—Les Criquets Pèlerins en Afrique Equatoriale Française. *Issued by Gouvernement Général de l'A.E.F.*

165. Zolotarevsky (B. N.) et de Lépiney (J.), 1934.—Note préliminaire sur *Schistocerca gregaria*, Forsk. dans le Nord-Ouest du Soudan Français. *Bull. de la Soc. d'Hist. Nat. de l.Afr. du Nord, Vol. XXV, No.* 1.

166. Zolotarevsky (B. N.) de Lépiney (J.) et Dupont (L.), 1934.—Note préliminaire sur *Schistocerca gregaria*, Forsk. dans le Soudan Français Oriental. *ibid, No.* 4.

167. Zolotarevsky (B. N.) et Murat (M.), 1938.—Rapport Scientifique sur les recherches de la Mission d'Etudes de la Biologie des Acridiens en Mauritanie (A.O.F.). *ibid. XXIX, No.* 19.

168. Anon., *circa* 1944.—Réglementation et organisation de la Lutte contre les Acridiens en Afrique Occidentale Française. *Issued by Gouvernement Général de l'A.O.F.*

XV.—TERMITES

169. Bredo (H. J.), 1941.—Les termites. *Essor agric. Katanga.*

170. Grassé (P. P.), 1936.—Les termites en Afrique occidentale française. Leur importance économique. Les moyens de lutte. *Rev. Path. veg.* 23., *No.* 4.

171. Hargreaves (E.), 1929.—Termites : Their control in the Field and in Buildings. *Leaflet Dept. Agric., Sierra Leone, No.* 4.

172. Patterson (W. H.), 1925.—Suggestions for the control of Termites or White Ants in Buildings. *Bull. Dept. Agric. Gold Coast, No.* 1.

173. 1926.—Notes on Termites in the Gold Coast. *ibid. No.* 7.

174. Pomeroy (A. W. J.), 1927.—Report on the Economic Importance of the Damage due to Termites or White Ants in Accra and Achimota on the Gold Coast and the methods by which their loss may be curtailed. *Gold Coast Govt. publ. X*, 1926-27.

175. Anon, 1935.—Notes on Termites and anti-Termite Work. *Issued by Public Works Dept., Nigeria.*

XVI.—WILD SILK MOTHS (Anaphe spp.)

176. De Fleury (P.), 1925.—Etude biologique sur *Anaphe ambrizia* (Btlr) (?) de la Guinée française et examen technique de sa soie.—*Ann. Soc. ent. France xciv., Pt.* 4.

177. Golding (F. D.), 1942.—The wild silkworms of Nigeria. *Farm and Forest, Vol. III, No.* 1.

178. 1942.—The wild silkworms of Northern Nigeria. *ibid. Vol. III, No.* 3.

179. 1944.—The specific Identity of wild silkworms. *ibid. Vol. V, No.* 2.

180. Michel (E.), 1928.—Les vers à soie sauvages du Congo belge.—*Publ. in Brussels.*

181. Pomeroy (A. W. J., 1921.—The irritating hairs of the Wild Silk Moths of Nigeria. *Bull. Imp. Inst., Vol. XIX.*

182. 1923.—The Production of Anaphe Silk for export and its possible economic value. *2nd Ann. Bull., Dept. Agric., Nigeria.*

183. Vuillet (J.), 1924.—Vers à soie sauvages du Soudan français et de la Haute-Volta.—*Rev. Bot. appl. and Agric. Colon. iv., No.* 40.