

IMPORTANT INSECT PESTS OF FORESTS AND THEIR CONTROL

by

Mohammad Shamsul Hasan Khan*

Summary

Information on biology and insecticidal control of nursery pests such as cutworms, army-worms cock-chafers, white ants, plant lice and some important insect pests of forest plantations like defoliators and borers has been comprehensively reviewed.

Ekalux, Azodrin, Lebaycid and Bidrin against leaf eating insects and Dieldrin, Aldrin and Heptachlor against white ants and wood borers have been recommended.

Introduction

Due to the vastness and difference in the ecological conditions, forest trees harbour various types of pests. For effective eradication of these pests, it is necessary to have definite knowledge about the habits, habitat and nature and extent of infestation of these noxious pests. In this paper, the author has discussed a few important insect pests of economic importance and suggestions have been given to control them with effective insecticides. In making the recommendations, stress has been laid on pesticides recently introduced in Pakistan. These pesticides have been extensively tested on pests attacking field crops, like cotton, sugarcane, tobacco, vegetables etc.

INSECTS INFESTING NURSERY PLANTS

Seedlings are destroyed by cutworms, armyworms, cock-chafers, white ants and variety of sucking pests, like thrips, jassids, whiteflies etc.

Cutworms

Different species of cutworms devour the plants, but *Agrotis ypsilon* is especially serious. It is nocturnal in habit and cuts forest nursery plants at night. It is equally destructive to cotton, tobacco, maize and potato crops.

*The author is Technical Manager, Agrochemical Department, Sandoz (Pakistan) Limited.

Control: Ekalux 25% E.C. 24—28 Fl.ozs. per acre of nursery

Phosvel 40% E.C. 20—28 „ „ „ „ „

Azodrin 56% E.C. 18—24 „ „ „ „ „

Other pesticides like Thiodan 35%, Gusathion-M 20% E.C., Carbicron-100 etc. have also proved effective. Repeated experiments on cotton have proved that spraying done in the late afternoon gave better results than forenoon spraying. This may be because cutworms are nocturnal in habit and spraying closer to their attack period keeps it more potent and effective. Experience on cotton spraying proved that cutworm become alert by the noise of motorized sprayers and fall from the leaves and hide into the field crevices. Therefore, for better results, the fields were flooded after spraying and soil-insecticides like Dieldrin was sprinkled. This gave a double protection.

Armyworms

Armyworms are not regular pests of forest nurseries but appear occasionally in epidemic form. They are shy insects, and remain mostly in bands. They migrate in army-like formation and devour whatever comes in their way. They are voracious feeders and it has been noted that within a few hours a mature cotton plant is denuded of all the leaves. They are very agile and on the slightest movement or disturbance, they fall from the plants and hide in crevices.

Control: Azodrin 56% E.C. 28—32 Fl. Ozs./acre of nursery

Ekalux 25% E.C. 30—32 „ „ „ „

Dipterex 80% S.P. 28—32 „ „ „ „

Phosvel 40% E.C. 30—32 „ „ „ „

Other pesticides like Carbicron, Nexagon, Merhyl parathion etc. have also proved effective.

Cock-chafers

The grubs of these scarabid beetles live in soil and devour roots of young seedlings.

Control. Soil-insecticides, like Heptachlor, Dieldrin, Chlordane are very effective. Granular pesticides, like Ekalux 5% GR, Azodrin 5% GR., and Dipterex 5% G.R. can also be used, and for better results, nursery beds should be divided in small compartments and flooded with water. Granular pesticides should be broadcast at the following rates:

Ekalux 5% GR. 20—25 Lb/acre of nursery

Azodrin 5% G.R. „ „ „

Dipterex 5% G.R. „ „ „

White-ants

Termites attack young plantings of shisham, poplar etc. They also attack grown-up trees and destroy the wood. Being polyphagous in nature, they are destructive to practically every thing made of wood, paper, cloth, jute etc. Termites are soil pests and dwell in the ground by making highly specialized galleries.

Control. Soil-insecticides, like Heptachlor, Dieldrin, Aldrin etc. have proved very effective. Sugarcane crop is badly attacked by termites. In an experiment, carried out with Solvirex 10% G.R., for the control of Sugarcane Pyrilla, it was noted with great interest that termites were also killed, and for a considerably long period no new attack was noted. On digging the termite mounds, high casualty of termites was recorded.

Sucking pests

Aphids, jassids, thrips and white-flies attack young leaves of nursery plants and devoid them of the leaf-sap. Also they act as virus vectors, and inoculate virus diseases in the plants. In size they are minute, but in inflicting damage, they are more harmful than even cutworms and armyworms.

Control. Organo-phosphatic insecticides, like Anthio 25% E.C., Ekatin 25% E.C., Dimecron-100%, Metasystox 25%, E.C. Nexion 25% E.C., Malathion 57% E.C. etc. have proved very effective. Systemic granular insecticides, like Solvirex 10% G.R., Disyston 10% G.R., Thimet 10% G.R. etc. have proved very effective for the control of sucking pests infesting cotton, sugarcane, maize, tobacco, vegetables etc. In forest nurseries and young plantation, these granules may be used. Advantages of granular pesticides are more, as they are long-lasting, easy to handle and in the long term, economical. As these granulates are toxic, rubber gloves should be used by workers handling them.

Insect pests infesting forest trees and plantations

These insects may be classified as:

Defoliators	Shisham defoliator	<i>Plecoptera reflexa</i>
	Poplar defoliator	<i>Ichthyura anastomosis</i>
		<i>Cerura wisei</i>
	Bakain defoliator	<i>Ascotis imparata</i>
	Babul defoliator	<i>Taphrina desputaria</i>
Leaf rollers	Shisham leaf-roller	<i>Dichomeris eridantis</i>
		<i>Apoderus sissu</i>
	Mulberry leaf-roller	<i>Margaronia pyloalis</i>

Leaf miners	Shisham leaf-miner	<i>Leucoptera sphenograpta</i>
Leaf stitchers	Poplar leaf stitcher	<i>Gypsonoma hapalosarca</i>
Skeletonizers	Poplar skeletonizer	<i>Molasoma populi</i>
Shoot borers	Semul shoot borer Cedrus shoot borer	<i>Tonica niviferana</i> <i>Hypsipyla robusta</i>
Tree borers	Poplar tree borer	<i>Aeolesthes sarta</i> <i>Melanophila picta</i>
Tree girdlers	Pine girdlers	<i>Hylobius angustus</i>
Bark beetles	Conifer bark beetle	<i>Scolytus major</i> , <i>Platypus biformis</i>
Sap-wood borers	Sapwood borer of hardwood	<i>Stromatium barbatum</i>
Powder post beetles		<i>Sinoxylon anale</i>
Cone borers	Chalgoza cone borer	<i>Dioryctria abietella</i>
Fruit borer	Walnut weevils	<i>Alcidodes porrectirostris</i>

Out of these, the following merit attention:

Leaf stitchers

Gypsonoma hapalosarca is a lepidopterous pest of poplars and as indicated by its name, it stitches together the leaves of plants. In the beginning two leaves are stitched together which increase and in severe cases, ten to fifteen leaves are stitched together. Inside this artificial shelter, the caterpillars live and devour the parenchyma tissues of the leaves, leaving only the skeleton hanging on the plants. It has 6-7 generations and become active from the beginning of April.

Control. Experiments at the Pakistan Forest Institute, Peshawar, have been carried out to evaluate suitable pesticides for effective control of this pest. With the permission of the Entomologist, the author is reproducing results of a trial conducted during 1973-74.

Effect of Insecticides on Poplar Leaf Stitchers, *Gypsonoma hapalosarca*

Insecticides	Dose	Average No. of larvae per 100 stitched leaves		Percent mortality of larvae
		Pretreatment	48 hours after	
Ekalux 25% E.C. ..	0.1 %	23.3	Nil	100
Bidrin 85% E.C. ..	0.01%	28.3	13.3	53
Lebaycid 50% E.C. ..	0.01%	28.3	5.0	82
Metasystox 50% E.C. ..	0.01%	31.6	18.3	42
Dipterex MR 50% E.C. ..	0.01%	36.6	13.3	64
Check (No treatment) ..		27.7	—	—

Reproduced from: "Trial of systemic and synthetic insecticides against the Poplar Leaf Stitcher, *Gypsonoma hapalosarca* Meyr". by M. Ismail Chaudhry and Bashir Hussain Shah, Pakistan Forest Institute, Peshawar.

Leaf Miners

Shisham leaf miner, *Leucoptera sphenograpt* Meyr, is a serious pest of nursery as well grown-up trees. It causes premature leaf fall. It completes its life cycle in about a months time and has 9 generations in a year. In case of severe infestation, all the leaves of the plant are shed-off, resulting in poor and stunted growth. Leaf-miners lay eggs on the under-surface of leaves, and after hatching, the miners bore into the leaves. Heavy attack has been recorded in the months of October-November.

Control. Experiments carried out at the Pakistan Forest Institute, Peshawar reveal that insecticides like Ekalux 25% EC, Dimecron-100, Thiodan 35% EC, Lebaycid 50% EC and Bidrin 85% EC have proved effective for the control of this pest. With the permission of the Entomologist, the author is reproducing results of an experiment, which was conducted during 1973-74.

Insecticides	Percent larval mortality after								
	24 hours			48 hours			72 hours		
	Doses	0.01 %	0.5 %	0.1 %	0.1 %	0.05 %	0.01 %	0.01 %	0.05 %
Dimecron-100	20	79	90	40	100	100	50	Nil	Nil
Ekalux 25% EC	81	92	100	100	100	100	100	Nil	Nil
Thiodan 25% EC	34	53	71	87	100	100	100	Nil	Nil
Lebaycid 50% EC	88	100	100	100	100	100	100	Nil	Nil
Bidrin 85% E.C.	62	85	91	96	100	100	100	Nil	Nil
Control	0	0	0	2	2	2	2	2	2

Reproduced from: "Efficiency of synthetic insecticides against Shisham Leaf Miner, *Leucoptera sphenograpta* Meyr. "by M. Ismail Chaudhry and Ashiq Ahmad, Pakistan Forest Institute, Peshawar-1974.

Shisham defoliator

Plecoptera reflexa Guen. is a serious pest of shisham in the irrigated and road-side plantations. There are about 10-11 generations of this semilooper, which cause about 6-80% loss of growth of this important plant. The trees remain leafless, for the major part of the growing period, thereby causing serious reduction in growth.

Control. Insecticides, like Endrin, Lebaycid, Sevin, BHC, Malathion, Thiodan and Dimecron have been used to combat this pest. Endrin proved to be very effective. Ekalux 25% E.C. has been used for the control of semiloopers, attacking cotton, and very encouraging results have been achieved.

Powder post beetles

Sinoxylon spp. cause extensive damage to timber and firewood of Shisham trees. These bostrychid beetles have 3 generations and the young grubs live in galleries, made into the felled trees, thus lowering the quality of the timber, as well loss of weight, which has been recorded to the tune of about 30% or more.

Control. Chlorinated insecticides, like Dieldrin, BHC, DDT have been used and good results have been achieved.

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