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Insect Pests of Sunflowers

in Manitoba

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INSECT PESTS OF SUNFLOWERS IN MANITOBA

by

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ECONOMIC IMPORTANCE

Several species of insects attack sunflowers in Manitoba. The moth Phalonia hospes Wlshm. has been one of the most important insect pests and has caused an average crop loss up to 7 1/2 per cent. The sunflower moth[1] has been very destructive to sunflowers in the past but has not been of economic importance since 1944. Heavy infestations of the sunflower maggot[2] may cause crop loss through interference with the seed-set of the plant. The sunflower beetle[3] is present annually and causes varying degrees of damage. Periodically, the painted-lady[4] appears in large numbers and may cause severe crop damage.

PHALONIA HOSPES WLSHM.

Description of Insect

The adult is a small, straw-colored moth with brown markings across the middle of the wings. It is about a quarter of an inch long, with a wing-spread of about half an inch. The egg is oval and is just visible to the naked eye. It is white when laid but gradually changes to light brown. The newly hatched larva is white with a dark-brown head and is about a sixteenth of an inch long. As it grows it gradually changes in color to light pink or yellow, then to reddish or purplish, and finally to green at maturity. When fully developed it is about five-eighths of an inch long. The larval cocoon is from a quarter to half an inch long, a sixteenth of an inch thick, sausage-shaped, and matted with soil. It is difficult to distinguish from small particles of soil. The pupa is dark brown and about a quarter of an inch long.

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[1] *Homoeosoma electellum* (Hulst).
[2] *Strauzia longipennis* (Wied.).
[3] *Zygogramma exclamationis* (F.).
[4] *Vanessa cardui* (L.).

Life-history

The moths begin to emerge from the soil about mid July and are present in the field until late August. Within a week after emergence they begin to lay eggs on the bracts of the sunflower heads. Eggs may be found until the end of August. They hatch in five to eight days. Larvae may be found in the heads from late July to mid September. They then drop to the ground and spin cocoons in the soil, in which they pass the winter. Pupation takes place in late June or early July the following year. The pupal period lasts about 12 days.

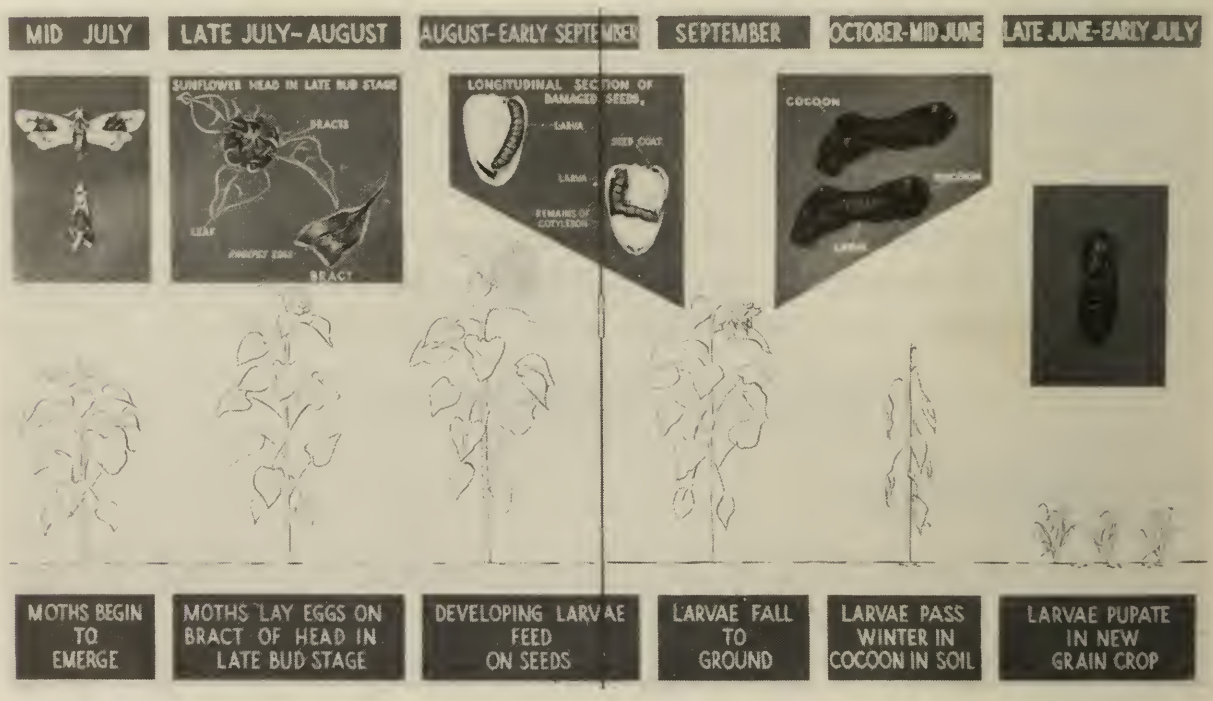

Figure 1.--Life-history of Phalonia hospes.

Description of Damage

Larvae of this insect feed chiefly on the seeds of the plant. The newly emerged larvae feed on the pollen of the florets, but as they develop they burrow into the seeds. A small hole at the top of the seed usually indicates P. hospes damage. Part or all of the contents of the seed may be consumed. Each larva destroys an average of 2 1/2 seeds.

Control

Natural. - Three species of parasites attack *P. hospes*. They are very effective in reducing the population of the pest. Up to 80 per cent of the overwintering larvae have been found to be parasitized.

Cultural. - Deep fall plowing of sunflower stubble fields reduces emergence of moths in spring by about 80 per cent. Planting of sunflower fields at a distance from the previous year's fields tends to lessen the infestation.

Chemical. - Some insecticides are effective against this pest. However, the crop must be sprayed at the time of bloom, when the plants are four to six feet high, and no practical method of application has been developed. In addition, spraying at the time of bloom is hazardous to pollinating insects.

SUNFLOWER MAGGOT

Description of Insect

The adult, or fly, is yellow with dark markings on the wings and is a little smaller than the house fly. The egg is banana-shaped and about a thirty-second of an inch long but is not readily seen because it is laid in the plant stalk. The newly hatched maggot is white and about a sixteenth of an inch long. As it develops it changes to a light yellow and when fully grown is about half an inch long. This stage of the insect is not readily visible unless the stalk is split, as the maggot develops within the plant stalk. The puparium is light yellow, segmented, and about a quarter of an inch long.

Life-history

The flies start to emerge from the soil early in June and within a week begin to lay eggs in the stalk near the top of the plant. Flies are present in the field until about mid July. The eggs hatch in about one week. The maggots feed in the pith until about the end of August. At this time they leave the plant and pupate in the soil, where they pass the winter.

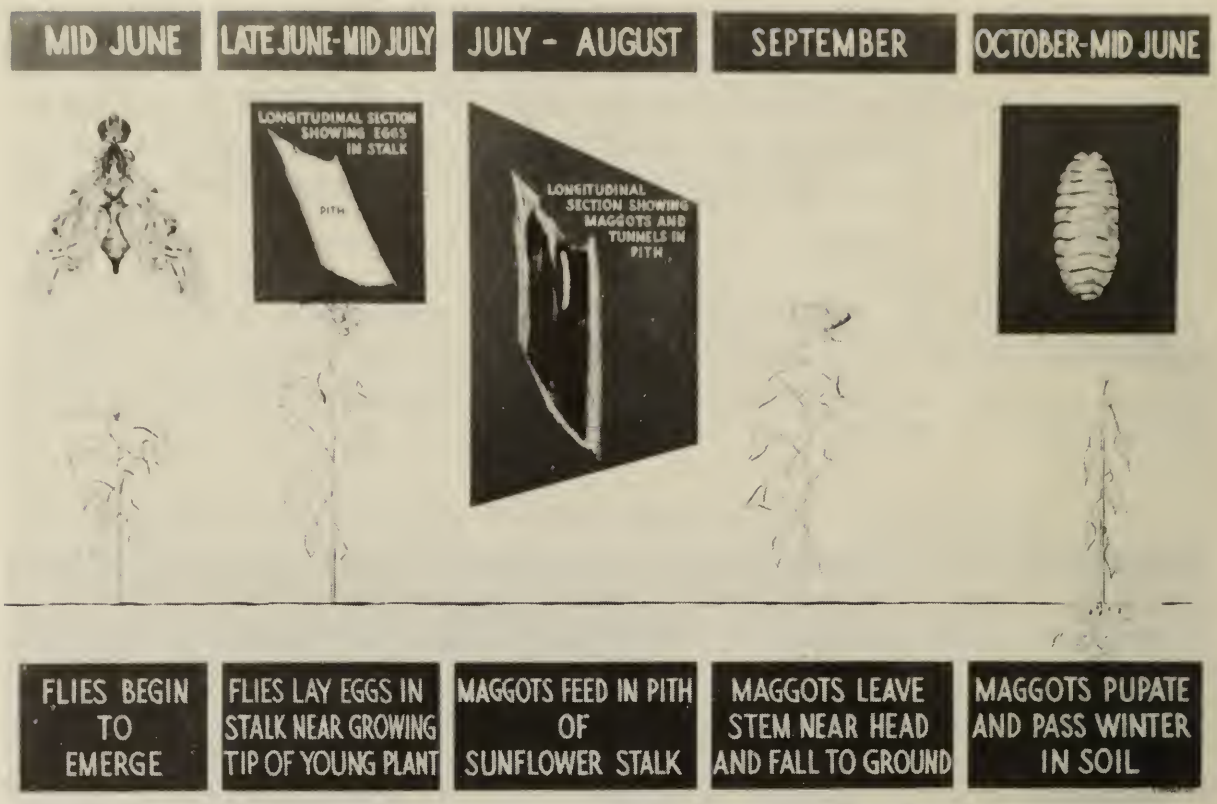

Figure 2. --Life-history of the sunflower maggot.

Description of Damage

The maggot feeds in the pith of the plant stalk. Tunnels and maggots may be seen by splitting the stalk of an infested plant. When a number of maggots are present in the same stalk, it may be completely hollowed out.

Control

Natural. - A parasite attacks this pest and aids in reducing the population.

Cultural. - Planting sunflower fields at a distance from the previous year's fields tends to lessen the infestation.

SUNFLOWER BEETLE

Description of Insect

The adult, or beetle, is similar in appearance to the common potato beetle but is smaller. Four black and five yellow stripes run lengthwise on each wing cover. The beetle is about

a quarter of an inch long and three-sixteenths of an inch wide. The egg is cigar-shaped, a sixteenth of an inch long, and yellow to orange-red. The larva is dull yellow-green and is sluggish and humpbacked. When fully grown it may be almost half an inch long. The pupa is yellowish and about the size of the adult.

Life-history

The adults emerge from the soil about the time the sunflower seedlings emerge. About one week after they emerge, the beetles begin to lay eggs singly on the undersides of the leaves. The eggs hatch within a week. The young, dull yellow-green larvae may feed on the leaves but are more readily found clustered in the bracts of the developing sunflower bud. The larvae are present in the field until late summer, when they enter the soil to pupate. The pupal period lasts 10 days to two weeks. The new-generation adults emerge and feed for a short period before entering the soil, where they pass the winter.

Description of Damage

The adults feed on the leaves of the young plants and when present in large numbers may do considerable damage, particularly to plants in the cotyledon and four-leaf stage. The larvae also feed on the plant foliage but are more often found in the flower bud. The damage caused by the adult is always more noticeable than that caused by the larva because there is so little plant foliage when the adults are active.

Control

Chemical. - A spray containing the recommended amount of any of the insecticides shown below will control the sunflower beetle. Weed sprayers are suitable for applying the spray, but only emulsion concentrates of the insecticide should be used with this type of machine. The recommended volume of emulsion concentrate per acre must be used regardless of the amount of water the sprayer delivers per acre.

Insecticide	Pints of emulsion concentrate per acre
Dieldrin, 20%	1
Aldrin, 20%	1
DDT, 25%	3
Chlordane, 40%	2
Toxaphene, 50%	2

Twenty pounds per acre of five per cent DDT or chlordane dust or 30 pounds per acre of five per cent toxaphene dust may be used instead of spray. To obtain good coverage it is best to apply dusts during the early morning or late evening, when the air is calm.

Caution. - Sunflowers are extremely susceptible to weed killers. Weed sprayers or dusters must be thoroughly cleansed before applying insecticides to sunflower plants.

A method of cleaning a sprayer of 2, 4-D is to rinse the tank and spray system thoroughly with successive rinses of: (1) water, (2) kerosene, fuel oil, or diesel oil, and (3) detergent or soap suds. After this the entire spray system should be filled with an ammonia solution (about one pint of household ammonia to each 10 gallons of water) and the solution allowed to stand in the system for 18 hours with hot water or 36 to 48 hours with cold water. After draining the ammonia solution it is important to rinse the entire spray system two or more times with clean water.

SUNFLOWER MOTH

Description of Insect

The adult is a small, silver gray moth about three-eighths of an inch long, with a wing-spread of about three-quarters of an inch. The egg is oval, pearly white, and just visible to the naked eye. The larva is purplish or reddish-brown with four longitudinal, light blue-green stripes on its back. When fully developed it is about three-quarters of an inch long. The pupa is reddish-yellow and about three-eighths of an inch long.

Life-history

The moths lay their eggs on and in the florets of the sunflower at the time the plants begin to bloom, and in about one week the eggs hatch. The larvae feed on the florets and seed for about one month. The winter is passed as a larva or pupa within a cocoon.

Description of Damage

The young larvae of this insect feed chiefly on the florets of the sunflower, but as the larvae develop they tunnel through the seeds. While feeding, the larvae spin silk threads, which become matted with florets and frass and give the head a trashy

appearance. Infestations may become sufficiently heavy to destroy all the seeds in a head.

Control

Natural. - A number of parasites attack the sunflower moth and aid in keeping down the population of this pest.

Cultural. - Planting sunflower fields at a distance from the previous year's fields tends to lessen the infestation.

PAINTED-LADY

Description of Insect

The adult is a colorful butterfly about one inch long, with a wing-spread of about two inches. The upper surfaces of the wings are brown with red and orange mottling and white and black spots. The undersides of the wings are marble-gray, buff, and white; each hind wing has a row of four distinct and one obscure eye-spots. The egg is small, spherical, and white. The caterpillars are brown to black, hairy, with a pale yellow stripe on each side, and about 1 1/2 inches long when fully grown. The chrysalid, or pupa, is the color of molten gold and is about one inch long.

Life-history

This insect breeds in Canada but migrates to the south to spend the winter. It returns in early June. Eggs are laid on the food plants and hatch in about one week. The larvae feed on the leaves. They mature in early July and form chrysalids that hang from the leaves of the plant. Butterflies emerge from the chrysalids in about 10 days and a second generation begins. The second generation is usually small in numbers and causes little damage to sunflowers.

Description of Damage

The painted-lady is present annually in small numbers and feeds chiefly on Canada thistle. It is thus beneficial and is often referred to as the thistle butterfly. Occasionally very large migrations occur and cultivated crops, such as sunflowers, are attacked. The caterpillars feed on the leaves and when numerous may completely strip the plant. The larvae produce a silk webbing

during their feeding activity.

Control

Natural. - The insect is usually heavily parasitized and often attacked by disease.

Chemical. - A spray containing three pints per acre of 25 per cent DDT emulsion concentrate or two pints per acre of 50 per cent toxaphene emulsion concentrate may be used to control the painted-lady. Twenty pounds per acre of five per cent DDT dust or 30 pounds per acre of five per cent toxaphene dust may be used instead of spray.

The method of application of insecticide and the method of cleaning a sprayer of 2, 4-D are the same as given under the control of the sunflower beetle (page 5).

For further information write to the:

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