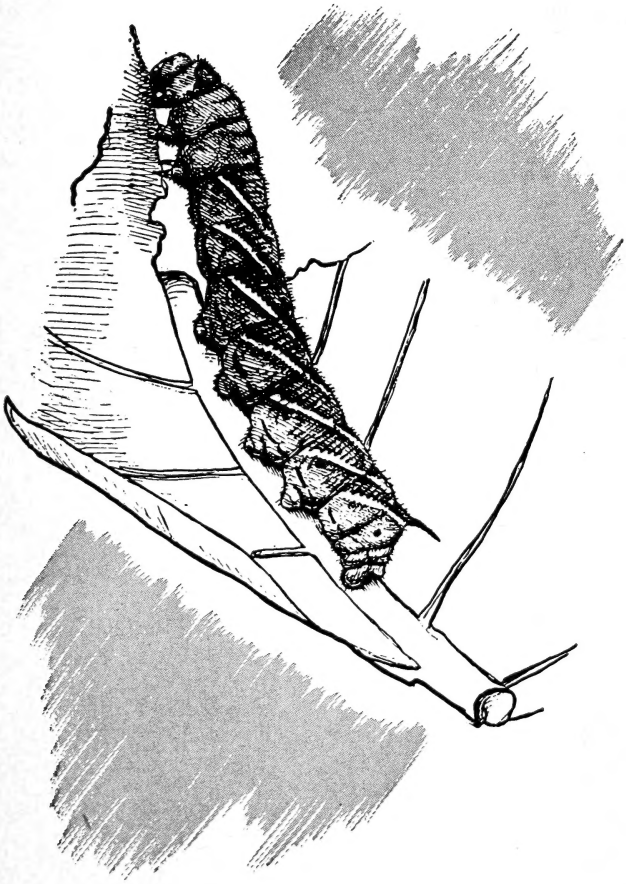
Control of Hornworms on Tobacco



Leaflet No. 336

U. S. DEPARTMENT OF AGRICULTURE

HORNWORMS are among the most destructive and widely distributed pests of tobacco, being found wherever this crop is grown in the United States. Since they feed so greedily and move so freely from plant to plant, even a few hornworms can devour or seriously damage large quantities of tobacco leaves.

Appearance

Hornworms are the caterpillars, or young, of large, brownish-gray, night-flying hawk moths. In flight these moths are sometimes mistaken for hummingbirds. The caterpillars are 3 to 4 inches long when fully grown and have a large "horn" near the end of the body. They are generally green, but some individuals may be brown to nearly black. Most infestations include two species, the tobacco hornworm and the tomato hornworm. While these species bear a close resemblance, each has its distinguishing features. The tobacco hornworm has seven diagonal black and white stripes on each side of the body and the horn is curved and red, whereas the tomato hornworm has eight V-shaped stripes and the horn is straight and black.

Development

The female moth lays small, round, green eggs principally on the underside of the tobacco leaves. In about 5 days a tiny hornworm emerges from each egg and begins feeding on the leaves. The hornworm continues to feed, pausing only to shed its skin, or molt, four or five times until it reaches full growth in about 3 or 4 weeks.

The full-grown hornworm burrows several inches into the soil, where it forms a cell and enters the resting, or pupal, stage. The dark-brown, jug-shaped pupae, about 2 inches long, are familiar sights in the soil when a tobacco field is being plowed. Ordinarily this inactive stage lasts from 2 to 4 weeks, but it may continue until the following year. During this period a moth is formed inside the pupa. When the moth emerges, it makes its way to the soil surface, to mate and lay eggs for the next brood of hornworms. There may be one to four or more broods each season, depending upon the latitude and the weather.

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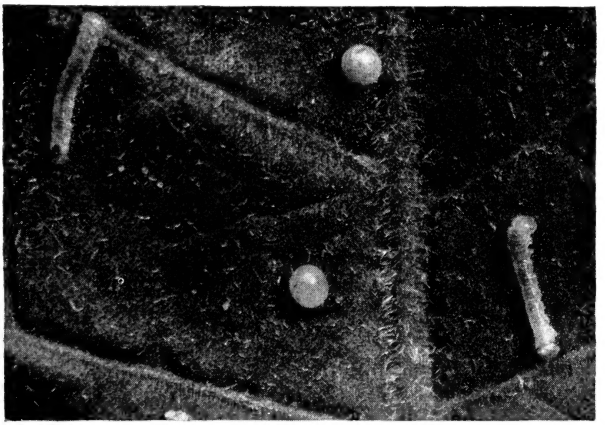
Cultural Control

Proper cultural practices will help keep hornworms under control and greatly lessen the need for insecticides. As soon as harvest has been completed, the plant stalks should be cut down. The suckers on these stalks sometimes furnish food for large numbers of hornworms, which overwinter and develop into moths the following summer. Fall plowing reduces the overwintering population of hornworms.

Where soil erosion is a factor, or where a grower for any reason may so desire, the field may be seeded to rye or some other suitable cover crop after it is plowed in the fall.



Eggs and newly hatched larvae of the tobacco hornworm.

Hand Picking

On small acreages the control of hornworms by hand picking is profitable and should be done whenever practicable.

Control With TDE Insecticide

TDE is the most satisfactory of several insecticides that are known to be effective against hornworms, and is the material recommended for controlling these insects on tobacco. It may be applied in either a dust or a spray, depending upon the equipment available.

Dusts

Apply a dust containing 10 percent of TDE at the rate of 8 to 15 pounds per acre on small to medium-sized plants, and of 20 to 30 pounds per acre on large plants.

Hornworms on underside of a tobacco leaf.

For best results dust early in the morning, at which time many of the hornworms are feeding, or late in the afternoon, when there is little or no wind movement. Dusts may be applied whether or not dew is on the plants.

Sprays

For application in a spray use either a wettable powder or an emulsifiable concentrate.

With a common ground sprayer of the high-pressure type, use either 4 pounds of 50-percent TDE wettable powder or 2 quarts of 25-percent TDE emulsifiable concentrate (or its equivalent) in 75 to 100 gallons of water per acre. Apply the smaller quantity of spray on small to medium-sized plants and the larger quantity on large plants. If the product you buy is of different strength, use sufficient wettable powder to give 2 pounds of TDE per acre, or sufficient emulsifiable concentrate to give 1 pound.

With a low-pressure ground sprayer use the same quantity of TDE emulsifiable concentrate in about 5 gallons of water per acre.

For aircraft application use 2 quarts of the 25-percent TDE emulsifiable concentrate in 2 to 5 gallons of water per acre, depending upon the capacity of the equipment.

How To Apply TDE

In applying either a dust or a spray, cover the plants thoroughly but lightly. The quantity of insecticide needed will depend on the size of the plants. Quantities greater than those recommended increase not only the cost of treatment but the hazard of harmful or otherwise objectionable residues on the tobacco.

When To Apply TDE

Examine each tobacco field for hornworm infestation every few days after the plants are about knee high, or when they are smaller in late fields. Apply the insecticide as soon as you find any small hornworms on the tobacco. They can be killed most easily when they are not more than about 1 inch long. Repeat the application whenever a survey of the field shows the hornworms to be abundant. Hornworms blend so well with the foliage that the plants must be examined closely to determine the extent of the infestation. In most fields one or two applications during the season are sufficient, but as many as four applications may be necessary in some fields when hornworms are abundant.

Never apply an insecticide to tobacco as a general precaution against hornworm attack. To do so may incur unnecessary expense and an excessive deposit on the tobacco.

Treatment of Other Insects Occurring With Hornworms

Hornworm infestations are sometimes accompanied by infestations of aphids or budworms. The TDE treatment will also control budworms. If the aphid infestation is severe, however, it may be necessary to apply parathion. The two insecticides may be used in one treatment. A dust containing 1 percent of parathion and 10 percent of TDE may be purchased for this purpose. Do not attempt to mix your own parathion dust (see Precautions on p. 6). If you use a spray, add 1 pound of 15-percent parathion wettable powder to the quantity of TDE spray to be applied per acre.

Do not include parathion in the hornworm treatment unless an examination of the plants shows that the aphids are numerous. In addition to the personal hazards to the operator, unnecessary applications of parathion may destroy many natural enemies of both hornworms and aphids. Furthermore, special precautions must be followed in using parathion (see p. 6).

Some Insecticides Reduce Value of Tobacco

Certain insecticides that are effective against hornworms cannot be recommended, because their use may lower the value of the tobacco crop. Growers who apply these materials risk having their crop down-graded on the market, or even rejected, because of disagreeable odor or the presence of undesirable residues. BHC and toxaphene have been found to impart disagreeable odors to the cured tobacco, and may seriously impair the flavor and aroma of cigarettes. There are indications that lindane may also impair the flavor of the cured tobacco. Lead arsenate leaves residues of two poisons, lead and arsenic. Paris green also leaves residues of arsenic, and under some conditions may cause plant injury.

From the evidence now available of insecticides that will control hornworms on tobacco, TDE presents the least hazard to dust formulators, persons applying the insecticide, crop handlers, and smokers. It has not been found to impair the smoking quality of the cured tobacco. However, to avoid excessive quantities on the tobacco, it

is important that TDE be applied only in accordance with recommendations.

Precautions

Handle all insecticides with care. Avoid unnecessary exposure while mixing or applying them.

TDE is much less toxic to warm-blooded animals than most insecticides, when used at the dilutions and dosages recommended for hornworm control and when spread thinly on the plants. The wettable powder does not cause skin irritation, although the emulsifiable concentrate may do so. However, avoid breathing the dust or getting the spray emulsion on the skin.

Parathion is especially dangerous to handle and apply. For this reason growers are cautioned not to mix their own parathion dusts. Parathion dust or spray should be applied only by trained operators, who understand the dangers and who will assume full responsibility and enforce the precautions prescribed by the manufacturer.

If you use parathion, do not breathe in the dust or mist. Wear a mask or respirator passed by the United States Department of Agriculture for parathion protection. Keep the insecticide off the skin and out of the eyes. When available, use a hand crank duster with a discharge tube extending backward. Wear rubber gloves and protective clothing. Do not get the poison in the mouth. Wash the hands and face before eating or smoking. Bathe thoroughly after working with parathion and wash your clothing before wearing it again.

When applying parathion from high-pressure sprayers or aircraft, take the following precautions: Keep all persons out of the treated area or its vicinity where there may be danger of drift. Do not allow anyone to reenter until the drifting insecticides and volatile residues have dissipated.

If a person using parathion develops headache, nausea, impaired vision, or tightness of the chest, get him to fresh air at once. Give an emetic such as mustard or warm soapy water immediately, and call a doctor. Atropine sulfate is an antidote for parathion. Obtain it by prescription in $\frac{1}{100}$-grain tablets. For severe poisoning give two tablets at once and get medical help.

To control insects on tobacco, use only recommended insecticides and follow the recommendations carefully.

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Scientific Names

Tobacco hornworm
Protoparce sexta

Tomato hornworm
Protoparce quinquemaculata

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