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Detecting and Controlling **The Corn Earworm** *in the Willamette Valley*



The corn earworm is the key insect pest of corn grown in the Pacific Northwest. Corn attacked by the larvae will display ears with brown frass near the tips. Kernels, particularly the ones near the silk, will be eaten down to the cob by large, greenish brown worms reaching nearly 2 inches when full grown (figure 1).

This insect is not a problem in field corn and only rarely a problem in sweet corn in the Willamette Valley. That's why insecticides are not recommended for its control in most years. However, sporadic outbreaks do occur, such as one in the summer of 1983.

The later-harvested sweet corn is most susceptible to infestation. Outbreaks usually follow mild and relatively dry winters.

Life history

The corn earworm overwinters in the soil to a depth of 6 inches as a reddish brown pupa. The moths (figure

2) emerge in the spring. Their wings span about 1 1/2 inches, are light grayish brown marked with irregular dark lines, and have dark areas near the tips.

The moths fly during warm, cloudy days, usually at dusk, which is when the females deposit eggs on host plants. They are quite prolific; each female is capable of laying from 500 to 3,000 eggs.

The hemispherical yellowish eggs are about the size of a pinhead and are laid singly on host plants. Fresh corn silk is the most attractive site for egg deposition (figure 3).

The eggs hatch in from 4 to 10 days. The young larvae first nibble at the silk, until it dries out. Then they invade the ear and feed on the kernels near the tip for 2 to 4 weeks (figure 4).

At maturity, they chew through the husk (figure 5), drop to the ground, and pupate in small earthen cells in the soil. There is probably one generation a year in the Willamette Valley.



Figure 1.—*Mature corn earworm larva*

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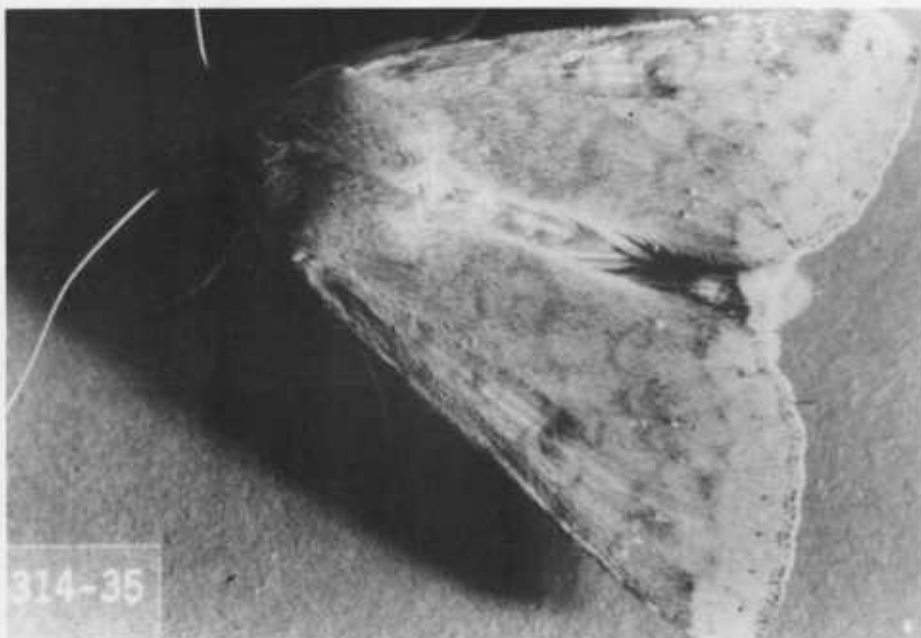


Figure 2.—*Corn earworm moth*

Further, it appears that only in seasons following dry, mild winters does the corn earworm become a pest.

The heavy soils of the valley—coupled with the large amount of rainfall that we usually experience in normal winters and springs—often result in heavy mortality to the overwintering pupae.

Therefore, it appears that in most seasons the corn earworm must reinvade the Willamette Valley. This happens when moths emerge from overwintering pupae that fly in from areas north or south of the Willamette Valley, where climate and soils favor the overwintering pupae.

Plants attacked

Corn earworms attack corn, tomato, vetch, lettuce, and certain weeds.

Monitoring and control

The sex pheromone of the female corn earworm has been identified and is commercially available for use with corn earworm traps. These pheromone traps can be used to detect and monitor the flight activity of the corn earworm for a given field or area.

Traps and pheromone are produced and distributed wholesale by:

Pest-Select
P.O. Box 278
Buckeye, Arizona 85326.

Pheromone capsules are also available from these two firms:

Trce, Inc.
635 S. Sanborn Rd., Suite 17
Salinas, California 93905

Bend Research, Inc.
64550 Research Rd.
Bend, Oregon 97701



Figure 3.—*Corn earworm eggs*

Use one “Pest-Select, *Heliothis* trap” (figure 6) in sweet corn to determine if corn earworm moths are active during silking. Place one trap on the upwind side of corn plantings at the same height as the silk.

Check the traps each week and record weekly captures of moths. If you catch over 30 moths a week during silking, you should conduct an egg survey.

You do this by inspecting the silk to determine if corn earworm eggs (figure 3) are present during the fresh, wilted, and brown silk stages.

Inspect the silk of 100 ears randomly throughout the planting and record those with corn earworm eggs. If at least five ears have eggs, you should consider two to three insecticide sprays (3 days apart).



Figure 4.—Corn earworm larva and the damage it does



Figure 5.—Exit hole of the corn earworm larva

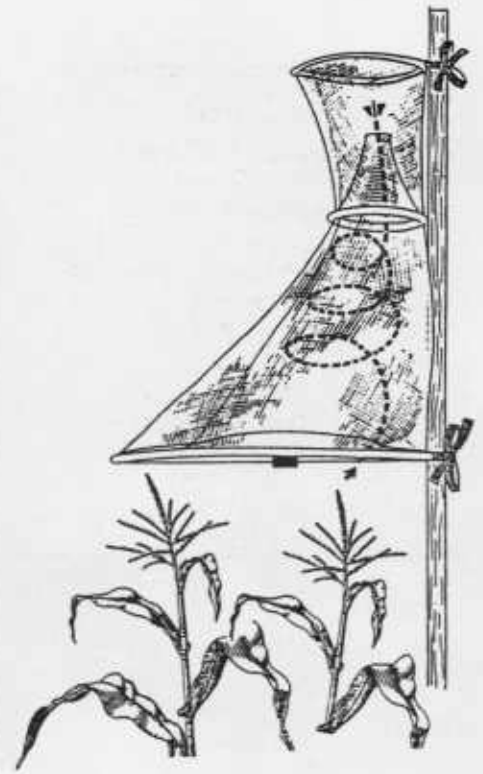


Figure 6.—Pheromone trap for corn earworms

Which insecticide?

Each insecticide has advantages and disadvantages, and these are discussed separately below. For large commercial fields under heavy earworm attack, Ambush, Pounce, Pydrin, Sevin XLR, or methomyl will give the best protection.

However, these materials can be highly toxic to honeybees that forage for pollen in cornfields. For this reason, there are certain restrictions on their use in corn. Check with the Oregon Department of Agriculture for current laws.

Sevin and malathion can be used for small acreage or backyard gardens. These materials, though, are considerably less effective than the first five. Apply them when silks first appear. Follow your first application with another, and possibly a third applica-

tion, at 3-day intervals if corn earworm moths are active, or if you see eggs on the silk.

Pydrin, Pounce, Ambush

These are synthetic pyrethroid insecticides that are very effective for controlling corn earworm. Use them at from 0.1 to 0.2 pound active ingredient per acre. Apply your sprays to the ear zone. Once you apply them and the materials have dried, they are repellent to honeybees, which will minimize bee kill.

Do not apply them during flight activity, though—use them only *before* or *after* bees forage.

Carbaryl (Sevin)

Direct this insecticide to the ear zone at the rate of 1.5 to 2 pounds of active ingredient per acre. The number and timing of applications depend on the severity of the earworm problem.

Sevin has been found particularly dangerous to bees that forage for corn pollen in certain areas (Sevin XLR is the least hazardous formulation to bees).

Methomyl (Lannate or Nudrin)

Methomyl is recommended at the rate of 0.45 pound active ingredient per acre. It is toxic to foraging bees.

Use pesticides safely!

- **Wear** protective clothing and safety devices as recommended on the label. **Bathe or shower** after each use.
 - **Read** the pesticide label—even if you've used the pesticide before. **Follow closely** the instructions on the label (and any other directions you have).
 - **Be cautious** when you apply pesticides. **Know** your legal responsibility as a pesticide applicator. You may be liable for injury or damage resulting from pesticide use.
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Individual ear treatment (home gardens, roadside stands)

Protect small acreages of sweet corn (grown principally for fresh market) from corn earworm losses by hand application of insecticides to the silk of individual ears. Sevin and (to a lesser extent) malathion have been used successfully in this manner.

Individual ear treatments are quite effective, but they are also more time-consuming. Of the many types used, the hand-daubing method is considered best.

The operator hangs a can of 5% dust around his or her neck and dust-daubs directly on the silk and husk necks with a brush (paint, shaving, or stencil).

Three or four ears can be treated from each renewal of dust from the can. This method requires up to 40 pounds of dust per acre per application.

Although it may appear to be a very slow method, an experienced operator can treat up to 2 acres a day, depending on the number of ears ready for treatment.

Use proper safety equipment.

Residue and feeding precautions

Pydrin, Ambush, and Pounce: You may harvest corn treated with these materials the day after application. There are no feeding or grazing restrictions on the sweet corn label.

Sevin: You may apply this insecticide up to, and including, the day of harvest if the sweet corn is to be used for human consumption or forage/fodder.

Methomyl: Do not let your cattle graze corn treated with methomyl, and do not feed treated plants to your livestock within 3 days after your last application.

Malathion: You can use 4 to 5% dust (applied by the individual-ear treatment method) up to 5 days before harvest without involving feeding regulations or exceeding the residue tolerance for human consumption.



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