A3655

Corn earworm

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The corn earworm, *Helicoverpa zea*, can cause serious economic damage to fresh market and processing sweet corn and hybrid dent seed corn. Also known as the tomato fruitworm, the larvae feed on field corn, tomatoes, lettuce, peppers, and snap beans.

Appearance

Full-grown larvae of the corn earworm are olive-brown, tan, maroon, pink, or black with three or four dark stripes along their backs. The head is yellow and not spotted. They measure up to 2 inches long when mature. Adults are robust, grayish-brown moths with a wingspan of 1½ inches. The front wings are marked with dark gray, irregular lines with a dark area near the wing tip. Eggs are tiny (1/32 inch), flattened spheres with prominent ridges. When deposited, the eggs are light yellow, but they darken to dusky brown before hatching.

Life cycle

Few corn earworms survive winter in Wisconsin. Instead, they overwinter as pupae buried in the soil in the Gulf States. In early spring, the pupae complete their development and emerge as moths in early May. Some of these moths migrate northward, flying mainly at dusk or during warm, cloudy days. The females lay eggs singly on fresh corn silks and on foliage. Fertilized females deposit up to 1000 eggs each. They are particularly attracted to sweet corn in the late tassel through early silking stages.

The eggs hatch within 1 to 8 days and the larvae immediately crawl into the silk channels at the ear tip to feed. Corn earworm larvae are cannibalistic; if one earworm encounters another, they will fight to the death. For this reason, only one larva is typically found per ear. During the entire larval stage, earworms move very little and feeding is confined to the ear tip. After 2 weeks, the larva drops to the soil and burrows 1 to 9 inches below ground to pupate. Approximately 2 weeks later, it emerges as a moth and works its way to the soil surface. Development from egg to adult takes about 30 days in midsummer.

In the north, a few pupae survive Wisconsin winters to complete development in the spring. As a result, sweet corn growers may find some adult moths in traps early in the season. This overwintering generation will only pose a problem in very early planted sweet corn. The more-damaging migratory adults appear between mid-August and early September. Fresh market sweet corn is susceptible to early- and late-season damage.

Damage

Larvae feed in the tips of the ears, devouring kernels and contaminating the ear. While even severe infestations damage fewer than 10% of the kernels, this amount is enough to cause serious economic losses in fresh market sweet corn due to consumer rejection, and in hybrid dent seed corn due to the high value of the crop. The value of processing sweet corn suffers as well since damaged tips must be removed before processing. Although some earworm damage can be found in commercial dent corn fields, the extent of loss is less severe and doesn't warrant control.

Earworm larva

Scouting suggestions

The best technique for monitoring earworms is through the use of pheromone traps. These traps use a special scent to attract male moths. Knowing when moths are present helps to determine when to treat fields. For information about trap designs and sources, contact Extension entomologists at the University of Wisconsin-Madison.

Earworm moth

Place a trap 4 to 6 feet above the ground on the south or west side of fields when corn is in the green silk stage. Pheromones should be changed every 2 weeks with the unused lures kept frozen until needed. Hercon® pheromone lures have been very effective at attracting earworm moths. For accurate counts, be sure to remove used lures from the trap area.

Another technique for monitoring earworms uses a blacklight to lure night-flying insects. However, blacklight traps are more expensive, less effective, and more difficult than pheromone traps to monitor. Counts in blacklight traps are consistently lower than those in pheromone traps in adjacent fields.

Pheromone trap catches of 5 to 10 moths or blacklight trap captures of 3 to 5 moths per night for three consecutive nights indicate that moths are probably laying enough eggs to warrant treatment of fields that are in the vulnerable stage between brush and silk browning. To add precision to your scouting, check silks for the small, spherical corn earworm eggs before beginning a spray program.

Control

Biological control

Several beneficial insects prey on earworm eggs, providing a small degree of non-chemical control. Trichogramma wasps and a number of chalcid and braconid wasps parasitize earworm eggs. The insidious flower bug, or minute pirate bug, seeks out eggs to feed on. Currently, releasing commercially available beneficial insects is too costly and labor intensive to be worthwhile. However, you can help conserve existing populations of beneficial insects by treating fields only when needed and avoiding broad-spectrum insecticides.

Earworm eggs may also become infected with a virus.

Organic control

Zea-Later™ is an applicator that combines *Bacillus thuringiensis* var. *kurstaki* with vegetable oil. This organic method of control, if timed correctly, can provide 80 to 90% control.

Chemical control

Once larvae enter the ear, they're protected from insecticides. Therefore, treatment timing is critical and control must be targeted at the adults, eggs, and young larvae before they're protected. The amount of time for egg hatch varies with temperature, but during periods of hot summer days and nights, eggs can hatch within 24 hours after they're laid. Thus, each day's delay in treatment may reduce the number of clean ears by 10 to 15%.

Insecticides must be present on vulnerable silks when eggs hatch. The first application is the most critical and tank-mixes containing an ovacide (an egg killer) and synthetic pyrethroid are recommended. On sweet corn, treat every 3 to 4 days beginning when silks first appear and continuing until they brown. On hybrid dent seed corn, make 1 to 2 applications during this period. Discontinue treatments 10 days before harvesting fresh market sweet corn and 18 days before harvesting processing sweet corn or dent seed corn as additional sprays will not improve product quality.

Select an insecticide with residual activity of a few days, such as the synthetic pyrethroids. For optimal coverage, set spray pressure to at least 100 psi and deliver 25 to 50 gallons of finished spray per acre using two nozzles directed at the ear zone from each side of the row.

Some corn earworm larvae in the Midwest have been confirmed to be resistant to synthetic pyrethroid insecticides, signalling that this insecticide may cease to be an effective means of control. However, commercial sweet corn growers have not yet reported any problems. Entomologists will continue to monitor earworm populations and will adjust treatment recommendations accordingly.

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