UT Extension
W195

Corn Insects

European Corn Borer

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Classification and Description: The European corn borer (*Ostrinia nubilalis,* Lepidoptera: Crambidae) is a major caterpillar pest of corn in the U.S. Corn Belt. Its biology is similar to another pest of corn, the southwestern corn borer. Female moths are about 1 inch long. Their wings have lateral patterns of yellow-brown and brown wavy lines. Male moths are similar but darker in color, and their abdomen is tipped with a tuft of hairs. Eggs are laid in an overlapping mass reminiscent of fish scales, like southwestern corn borer (SWCB). Egg masses typically range from 8-40 eggs, whereas SWCB egg masses normally have 2-6 eggs. Each egg is about pinhead-sized. Freshly laid eggs are translucent white to light green, but within 24 hours each egg develops a black center (i.e., blackhead stage). Newly hatched larvae have a dark head and somewhat translucent white body. Mature larvae are ¾ to 1 inch long with a dark brown head and a creamy white or gray body, sometimes with a pinkish hue. Rows of spots are sometimes visible on the body, but these spots are not distinct like those found on SWCB. Like most caterpillars found in corn, they have three pairs of true legs behind the head and five pairs of prolegs on the abdomen. Pupae are about ½ to ¾ inch long and dark brown.

ISU Image Gallery: www.ent.iastate.edu/imagegal/lepidoptera/ecb/

Hosts, Life History and Distribution: European corn borer (ECB) has a wide host range and is primarily considered a Midwestern pest. However, it is found throughout much of the East, Mid-South and Southeast. ECB has many weed hosts and can also be a pest in sorghum, cotton and other agricultural and horticultural crops.

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Three generations of ECB occur in Tennessee. The last generation overwinters as mature larvae. In corn, ECB overwinter in stubble, ears, in other plant debris or the soil. Overwintering larvae pupate in the spring, and moths emerge 7-10 days later. Female moths can lay many eggs, typically on the leaves near the center of the plant.

Pest Status and Injury: The European corn borer is found throughout Tennessee and may be the most common corn borer species found in the Middle and Eastern parts of the state. Nevertheless, it only occasionally causes economic damage to corn. The injury caused by ECB is very similar to southwestern corn borer, although ECB larvae are less damaging. On whorl-stage corn, hatching larvae move into the whorl and feed on leaves or tunnel into leaf midribs until they are about seven to 10 days old. Feeding signs include elongate window-pane lesions on emerging leaves. In tasseling corn, small larvae are found behind leaf collar and sheath areas or in silks. Older larvae tunnel into the stalk, ear shanks or ears until they pupate inside stalks or ears. Tunneling interferes with nutrient and water flow in the plant. Tunneled shanks may break, causing ears to fall on the ground. Unlike SWCB, late-season tunneling tends to be concentrated in the stem near or above the ear, and ECB larvae do not girdle the stem prior to overwintering. One sign of ECB infestation is when stalks break above the ear, whereas stalks tunneled by SWCB often lodge below the ear.

Management Considerations: European corn borer population levels vary widely from year to year and across different locations. Only two generations of ECB are likely to cause economic damage in corn. Like southwestern corn borer, ECB damage is less likely in pre-tassel corn, because the overall population size is usually lower at this time. The earliest-planted corn fields are at greater risk to infestation by first-generation ECB. Subsequent generations infesting older corn are more likely to cause economic damage. Later in the season, moths often concentrate their oviposition in late-planted fields. Planting early during the recommended planting window is suggested to avoid late-season infestations of ECB and other caterpillar pests (e.g., southwestern corn borer, fall armyworm and corn earworm).

Reduced tillage systems favor ECB, because larvae overwinter at the base of stalks. However, even extensive tillage has little impact on subsequent populations because ECB has many alternate hosts. Some kinds of Bt corn (e.g., YieldGard® and Herculex®) produce a toxin that is very effective in controlling corn borers. As part of an insecticide resistance management plan, a refuge of non-Bt corn is required for Bt corn. In cotton-growing areas of Tennessee, only 50 percent of a grower's corn acreage can be planted with corn that has a single Bt trait for controlling corn borers. Up to 80 percent Bt corn can be planted in non-cotton areas. Corn varieties

having two or more Bt traits (i.e., YieldGard VT Pro®, SmartStax®) are being developed. A smaller refuge of non-Bt corn will be required for these newer technologies, and these technologies also provide improved control of corn earworm and fall armyworm.

It is recommended that non-Bt corn be treated with insecticides if 50 percent or more of plants are infested with larvae or if one or more egg mass is found per plant. Insecticide choices for control of ECB are listed in the *Tennessee Insect Control Recommendations for Field Crops (PB 1768)*. It is important to make insecticide applications before most larvae begin tunneling into the stalk. In whorl-stage corn, high volumes sprayed directly into the whorl will provide the best results. Aerial applications are typically needed in tasseling corn, targeting second-generation larvae.

Pheromone traps are available for monitoring ECB moths' flights. These traps are seldom used in the South because ECB damage is less common in corn and also because nuisances in ECB biology make trap catches less useful for predicting field infestations. If moth traps are used, scouting should be started about five days after catches increase sharply.

Reference:

Handbook of Corn Insects. K. L. Steffey et al. (eds.). Entomological Society of America, 1999.

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