

ENTOMOLOGY FACT SHEET

European Corn Borer

Roger R. Youngman, Department of Entomology, Virginia Tech

Eric R. Day, Department of Entomology, Virginia Tech

DESCRIPTION OF DAMAGE

European corn borer (**ECB**) is a major pest of corn grown for grain in Virginia. This pest is found throughout the commonwealth, but its population density fluctuates from year to year in a given locality. Typical damage to corn plants caused by this insect are reduced plant vigor leading to subsequent ear drop and stalk lodging.

IDENTIFICATION

When fully grown, **ECB** larvae are 3/4 to 1 inch in length and creamy-white to pink in color. The larval head capsule is dark brown and, on top of each abdominal ring or segment, there are several small dark brown or black spots (Fig. 1). Pupae vary from 1/2 to 3/4 of

an inch in length, are torpedo in shape, and range in color from reddish-brown to dark-brown. The moth has a wingspan of about one-inch, with the female being slightly larger than the male. The wings are dusky-yellow in color and bear transverse, irregular, olive-green bands (Fig. 2). Although similar in appearance, male wings are often darker in color. Adult females typically lay 15 to 30 eggs in masses and may lay up to 500 eggs over their lifetime. Egg masses usually are laid on the underside of corn leaves and are about 3/4 of an inch in diameter (Fig. 3). Egg coloration changes from white to a creamy translucence during development. Immediately before hatching, the dark brown head capsules of the young larvae become visible through the shell (Fig. 4).



Fig. 1 European corn borer larva.

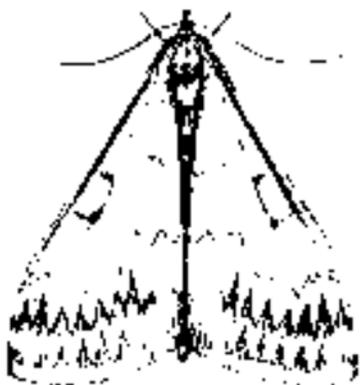


Fig. 2 European corn borer moth.



Fig. 3 New European corn borer egg mass.



Fig. 4 European corn borer egg mass at the blackhead stage just prior to hatching.

LIFE HISTORY

ECB overwinters as a full-grown larva either in tunnels of old corn stalks or in the junction formed by a leaf and stalk. In addition, **ECB** larvae will sometimes overwinter in side the stems of certain weeds. Development begins in spring when temperatures exceed 50 degrees F. Larvae pupate in late spring and emerge as adults after about two weeks. These first generation adults usually appear from mid-May to early June in Virginia with the exact date depending on both location and weather conditions. Moths become active in the evening seeking mates and laying eggs but spend the daylight hours hiding in grassy fence rows and other protected areas. First generation moths seek out the most mature (earliest planted) corn on which to lay their eggs. In addition to corn, **ECB** has been reported to feed on over 300 different plants, including green peppers, edible beans, and gladiolus. Weather conditions play an important role in governing the survival of **ECB**. Strong winds and beating rains during peak flight activity may dramatically reduce both egg laying and egg survival. In contrast, curling and uncurling of corn leaves during periods of drought can help dislodge the eggs from a leaf.

Under ideal conditions, egg hatch of first generation **ECB** takes place within three to seven days after the eggs are laid. The tiny caterpillars feed on leaves in the whorl causing a “shot-hole” appearance after the leaves have uncurled (Fig. 5). Older caterpillars tunnel in leaf midribs, but eventually bore into the stalk where they will complete their development in about three to four weeks. Full grown caterpillars pupate inside the corn stalks. In Virginia, second generation moths emerge and begin laying eggs from late June to mid-July. This second generation is considered to be the most damaging to corn grown for grain despite the fact that heavy infestations of first generation **ECB** can cause extensive visual damage.

Damage to corn by first-generation caterpillars is primarily physiological. Specifically, yield loss results from interference with transport of nutrients and water to the stalk and leaves. The extent of nutrient and water loss depends on weather conditions, soil type, plant variety, plant maturity, and level of infestation. USDA researchers in Iowa have shown yield reductions of about 8 bushels per acre from low **ECB** infestations and about 22 bushels per acre from large infestations.

Second generation damage consists mainly of stalk breakage (Fig. 6), ear drop, and ear feeding, and is more

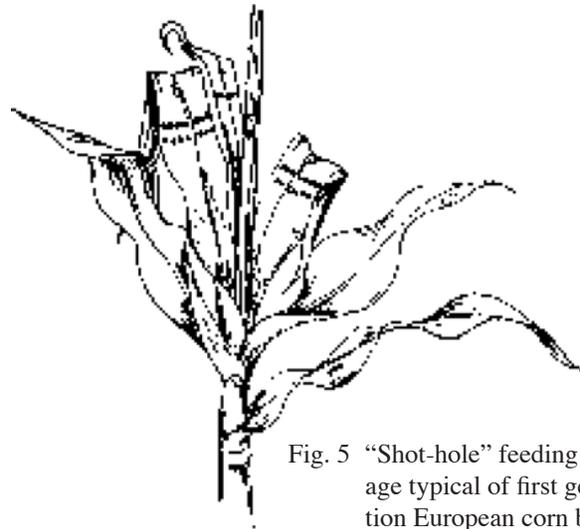


Fig. 5 “Shot-hole” feeding damage typical of first generation European corn borer infestations.



Fig. 6 Stalk breakage damage typical of second generation European corn borer infestations.

physical and potentially much more serious than first generation damage. In general, heavy infestations of second generation **ECB** can reduce yields by as much as 30 bushels per acre. Stalk rot diseases also tend to be more prevalent in areas infested by second generation **ECB**.

NON-CHEMICAL CONTROL

The most effective, non-chemical method for controlling **ECB** on corn is to plant resistant varieties selected on the basis of their ability to withstand attack. To determine the best variety for your location, consult your county extension agent or local seed distributor.

Other factors that can help minimize **ECB** damage are time of planting and spring plowing. Whenever possible, avoid planting corn too early or too late. Corn that has been planted very early can serve as an unintended “trap crop” for newly emerged first generation moths, resulting in heavy infestations and subsequent damage. Similarly, late planted corn can suffer even greater **ECB** damage because, as younger plants, they are less able to withstand the higher population pressure of the second generation. Spring plowing helps reduce the severity of **ECB** infestations by burying the previous season’s corn stalks and weed residues. Also, there is some evidence that chopping stalks after harvest with a rotary mower will destroy **ECB** caterpillars. It is important to realize, however, that because **ECB** moths are strong fliers, and thus, highly mobile, plowing and destruction of crop residues must be practiced on a large scale to achieve an area wide reduction in population size.

SCOUTING AND CHEMICAL CONTROL

Although second generation **ECB** are more likely to attack corn that has been planted late, all corn grown for grain should be scouted. To assess the potential for economic damage, begin checking for egg masses when second generation moths emerge and begin egg laying. The presence of **ECB** moths in areas bordering a field can be used to indicate a likely infestation. To survey for these moths, walk along the grassy sides of the field and look for large numbers of moths flying as a result of being disturbed. However, if no other information is available, it is suggested that scouting for egg masses be initiated the last week of June and continued at two to three day intervals through the third week of July. To do this, randomly select five sets of 20 consecutive plants from throughout the field. Count the number of egg masses found on each plant. **ECB** moths usually lay their eggs in masses on the underside of leaves, two or three leaves below the ear; however, because they can be laid anywhere, it is best to look for egg masses on every leaf. To reduce the potential for economic losses from second generation **ECB** in grain corn, an insecticide treatment is warranted if 35 to 50 percent (or more) of the plants in the pre to post-tasseling stage of development have at least one egg mass per plant. Consult the 1992 Pest Management Guide for Field Crops (publication number 456-016) for specific information on postemergence insecticides available for control of **ECB** on field corn.