



FALL ARMYWORM AS A PEST OF FIELD CORN

Spodoptera frugiperda (Smith)

The fall armyworm is a highly polyphagous migratory lepidopteran pest species. It can colonize over 80 different plant species including many grasses, and crops such as alfalfa, soybean, sorghum, and corn. In Pennsylvania, low populations are usually present late in the summer, but population densities are rarely high enough to be of economic concern in field corn. On the rare occasion that fall armyworm is problematic in field corn; the late-season timing of the infestations makes them difficult to manage because insecticide application may require specialized equipment to pass over tall corn. Fall armyworm is more likely to be an economic pest in sweet corn and vegetable crops.



Fall armyworm adult male (Left), adult female (Above).

Images by Ian Grettenberger



Fall armyworm larva. Image by Eric Bohnenblust

DESCRIPTION

Fall armyworms are similar in size and shape to other moths in the cutworm family. They are grayish in color with a wingspan of about 1.5 inches. The front wings of the male are a mottled grayish color with white markings near the wing tips. The front wings of the female are similar, but the markings are less distinct.

Fall armyworm eggs are laid in clusters of 50 or more in a single layer attached to foliage. Eggs are dome-shaped and dirty white to gray in color. After egg deposition, the female deposits grayish scales over the egg mass, giving it a hairy or moldy appearance.

Newly hatched larvae are pale green with black heads. During the second instar the head turns an orange-brown color. For the first few days the young larvae feed near the surface of the

ground. After about a week they move up onto the corn plants and consume all leaf tissue except the veins and midrib. Larval densities are often reduced to one or two per plant in heavy infestations as larvae can exhibit cannibalistic behavior. During the day, larvae are often found hiding in the whorl of the corn plant.

Fully grown larvae are 1.25 – 1.5 inches in length and vary in color from pale green to almost black, with a reddish-brown head. They closely resemble true armyworm, and corn earworm larvae in appearance. The difference is that the heads of fall armyworms have a prominent inverted “Y” and black tubercles from which hairs arise arrayed throughout the body. Fall armyworm pupates in the soil, and pupae can be identified by their smooth, leathery skin that is reddish-brown to dark brown.

LIFE HISTORY

Fall armyworms overwinter along the Gulf Coast, and moths generally migrate north and east into states where they are unable to diapause. In Pennsylvania, the vast majority of fall armyworms migrate from overwintering grounds in Texas. Their arrival time varies from year to year, but the first reported adult captures usually begin around the end of June and migrations become heavier as the season progresses.

Adults are nocturnal, and mate in the evening, when female fall armyworm call to males from the top of the crop canopy by releasing a sex pheromone. Males follow the pheromone plume to locate the females and when populations are high males can be seen flying in groups attempting to find a mate.

Upon arrival to a new field, the female moth deposits egg masses on green plants including important crop hosts. The eggs hatch about five to seven days after oviposition and the small larvae

then begin to feed on plants near the ground or in protected areas such as the whorl of corn plants. They usually go unnoticed until they are approximately an inch long. The larva goes through six instars (about 15 to 18 days) before burrowing one to three inches into the soil to pupate. Adults emerge about one to five weeks after pupation depending on soil temperature.

In Pennsylvania, adult emergence usually occurs about two weeks after pupation. After adult emergence and mating, some eggs are deposited in the same general area, but many moths migrate to infest new areas. Fall armyworm activity in Pennsylvania ends with the arrival of freezing temperatures.

DAMAGE

Fall armyworm generally feeds on foliage, but during heavy infestations, larvae will also feed on corn ears. Foliar damage to corn is usually characterized by ragged feeding, and moist sawdust-like frass near the whorl and upper leaves of the plant. Early feeding can appear to be similar to European corn borer damage; however European corn borer larvae bore into the stalk whereas fall armyworm larvae continue to feed on the foliage making larger more ragged holes. Ear damage is similar to the damage caused by the corn earworm, chewed kernels and visible frass, except that fall armyworm tends to burrow through the husk instead of feeding down through the silks.



Fall armyworm injury to corn plant. (Left) Fall armyworm larva damage on corn foliage. (Right) Images by Eric Bohnenblust.

CONTROL

Fall armyworm larvae can be difficult to control due to the timing of infestation in Pennsylvania. Corn plants often are too tall to spray with conventional ground rigs when populations are detected in Pennsylvania. However, because populations are usually low applying insecticides is rarely profitable. Therefore, insecticide control options should be attempted only in extreme situations (e.g., 100 percent of the plants are infested and they are less than 30 inches high).

Transgenic corn varieties are a more viable option for preventing/controlling fall armyworm. There are several varieties on the market that suppress/control of fall armyworm and many other lepidopteran pests. Be sure to follow refuge requirements associated with the use of Bt corn as different varieties have different requirements. Also, adding to the importance of following refuge requirements, a field population of fall armyworm in Puerto Rico has been found to be resistant to the Cry 1F toxin in many Bt lines. With proper management, resistance development is highly unlikely, but if refuge requirements are not followed serious consequences could occur.

If a control measure is warranted, consult the current issue of the Penn State Agronomy Guide for recommended Bt varieties, insecticides and dosage rates. You may also consult with your county agricultural Extension agent or farm supply dealer for suggested control measures.

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