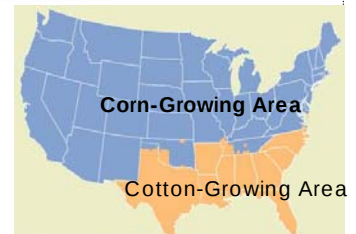


Fall Armyworm in Corn (Corn-Growing Area)

- Fall armyworm (FAW) larvae feeding can damage corn leaf or ear tissues at several corn growth stages.
- Larvae of FAW can be mistaken for other similar species.
- Genuity® brand corn products with insect trait protection have the potential to improve grain quality and yield potential by providing multiple modes of action for advanced above-ground insect protection.



Corn with Insect Trait Protection

Genuity® brand corn insect trait products have the potential to improve grain quality and increase yield potential by providing multiple modes of action for advanced above-ground insect protection. Genuity®VT Double PRO® and Genuity®VT Triple PRO® technologies provide dual modes of action for above-ground insects, including FAW, and Genuity® SmartStax® provides triple modes of action against FAW. Other corn products containing insect protection traits such as Optimum® AcreMax® or Optimum® Intrasect® only have a single mode of action against FAW (Table 1).

Identification

Fall armyworm (FAW) larvae can damage corn at various stages of development by feeding on leaf or ear tissues. FAW larvae are smooth-skinned, vary in color from light tan to dark green or black, with 3 yellow stripes and a dark stripe down the back. There is an equally wide, wavy, yellow stripe, splotched with red next to the dark stripe. Early instar larvae are dark green with black heads and usually found in groups on the plant. Larvae have 4 pairs of abdominal prolegs and a



Figure 1. Larva of fall armyworm (FAW), corn earworm (CEW), European corn borer (ECB), true armyworm (TAW), western bean cutworm (WBC), southwestern corn borer (SWCB). TAW, SWCB photos Frank Peairs, Colorado State University, Bugwood.org

pair of legs at the end of the body. Full-grown larvae are about 1.5 inches long.

Larvae of FAW, true armyworm (TAW), corn earworm (CEW), western bean cutworm (WBC), European corn borer (ECB), and southwestern corn borer (SWCB) can be mistaken for each other (Figure 1). Correct identification can impact management decisions. To differentiate FAW larvae from other species, look at the head of the larva. The head of a FAW has a prominent white, inverted Y-shaped mark between the eyes. FAW larvae have an inverted Y on their head capsule and vary from light tan or green to almost black.

TAW larvae have a gray or greenish-brown head covered with a network of lines.

CEW larvae usually have an orange head with no Y. CEW larvae vary in color ranging in from light green or pink to dark brown or nearly black. Early instars are nearly translucent light green and solitary. Bodies have alternating light and dark stripes running the length of the body and double dark stripes down the center of the back. The body is covered by regularly occurring tubercles with two or three stiff black hairs.

WBC larvae are tan with a darker, faint diamond shaped pattern on their back, and dark stripes immediately behind their head. SWCB larvae are dull white with a pattern of raised black spots on the

Table 1. Trait Comparison of Mode of Action (MOA) for Control/Management of Corn Insects in the Corn-Growing Area.¹

Insect Species	Genuity® SmartStax®	Genuity® VT Double PRO®	Genuity® VT Triple PRO®	Optimum® AcreMax®	Optimum® Intrasect®
Corn Earworm ²	**	**	**		
Fall Armyworm	***	**	**	*	*
European Corn Borer	***	**	**	**	**
Southwestern Corn Borer	***	**	**	**	**
Western Bean Cutworm	*			*	*
Refuge (Corn-Growing Area)	5% RIB	5% RIB	10% RIB	95:5 Integrated	5% Structured

¹MOA/Control of Pest * = single mode-activity, ** = dual mode-activity, *** = triple mode-activity;

²In the 2014 Product Stewardship Guide, DuPont Pioneer claims suppression of corn earworm with Optimum® AcreMax® and Optimum® Intrasect® products.

Fall Armyworm in Corn (Corn-Growing Area)

body. ECB larvae have smooth, dirty white colored skin, often having a pinkish tinge, with numerous dark spots scattered over the sides and top of the body. The head is dark brown to black.

Life Cycle

FAW moths migrate north during the growing season from overwintering sites in South Texas/Northern Mexico and South Florida. Adult moths lay masses of 50 to 150 spherical, gray eggs on leaves. Larvae hatch in 3 to 5 days and initially move into the whorl to feed. Typically, FAW require about 30 to 45 days to complete one generation. FAW has a wide host plant range that includes corn, sorghum, small grains, soybeans, cotton, bermudagrass, and rice.

Damage Symptoms

Young FAW larvae remove the top layer of the leaf and eat through leaves, causing small pin holes. Very early symptoms can resemble the small holes and window pane feeding injury from ECB.² Larvae continue to feed in the whorl, causing leaves to have a ragged appearance as they unfurl from the whorl (Figure 3). FAW actively feed during the day, particularly early in the morning and late afternoon, consuming large amounts of leaf tissue. Larvae can be found deep in the whorl, often protected by yellowish brown frass.

FAW will also infest corn from the tasseling to dough stage of growth. Larvae feed on tassels, immature ears, ear shanks, and tunnel into stalks. Heavy infestations of larvae feeding on kernels may result in yield losses. Yield losses may also occur from ear drop and lodging caused by larval feeding damage in ear shanks and stalks.¹

Comparing larval ear feeding damage:³

FAW feed by burrowing through the husk on the side of the ear, unlike corn earworm. Larvae also enter at the base of the ear, feeding along the sides and may tunnel into the cob. They usually emerge at the base of the ear, leaving round holes in the husks.

CEW enter the ear through the silk channel, unlike European corn borer and fall armyworm, which enter through the husks or cob. As silks dry, corn earworm begin feeding on kernels (Figure 2). Larvae feed at the tip and along the sides of the ear near the tip. CEW are cannibalistic with typically only one larvae surviving per ear.

WBC enter ears through silk channels or by chewing through husks, causing injury to the tip, base, and sides of the ear. Larvae of the WBC are not cannibalistic, and several may infest an ear.

ECB feed on pollen and silks before entering the ear and by tunneling through the shank and cob. ECB feeding injury can occur at both ends and along all sides of the ear.

Scouting

Scouting for FAW can be difficult. Early FAW damage appears as “window paning” and shot-holes in leaves. Damage from larger larvae results in ragged leaves. As corn ears develop, FAW larvae migrate

from the whorls to the ears and damage kernels. If whorl damage exists, scout 20 consecutive plants at 5 places in the field.²

Determine the percentage of plants damaged by FAW. Pull some whorls and unroll the leaves to make larval counts. Scout corn around tasseling and silking. Look for large larvae in emerging tassels and very small ears. Continue to check closely for this insect until silks dry.



Figure 3. FAW leaf feeding damage in the whorl. University of Georgia Archive, University of Georgia, Bugwood.org

Insecticide Applications

If the corn crop doesn't contain *Bt* traits that offer control against FAW, an insecticide application may be considered. However, the use of insecticides should only be used once the economic threshold has been met. Consult your local Extension agent for economic thresholds in your area. Insecticides should be applied before FAW larvae burrow deep into the whorl or enter ears of more mature plants. Insecticides may not be effective if the larvae are burrowed in the whorl because the frass can block the FAW feeding tunnel.

Sources: ¹Porter, P. et al. 2010. Managing insect and mite pests of Texas corn B-6177. Texas AgriLife Extension. ²Bessin, R. 2003. Fall armyworm in corn ENTFACT-110. University of Kentucky. ³Cook, K. 2005. Corn earworm, European corn borer, fall armyworm, or western bean cutworm: which one is causing the injury I'm finding on my corn ears? The Bulletin No. 23 Article 4. University of Illinois.



Figure 2. CEW silk feeding and kernel damage.

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