

## Fall Armyworm (*Spodoptera frugiperda*) in Corn

In the United States, damage from fall armyworm (FAW) can cause annual losses in corn. FAW larvae can cause extensive defoliation, damage the whorl, and feed on kernels of the developing ear. In addition, FAW ear feeding can increase the risk of mycotoxins, such as the development of aflatoxin. Although any growth stage can be targeted by FAW, later planted corn that has not yet begun to silk is preferred. Early scouting and accurate identification can help to protect yield potential.

### Life Cycle

FAW moths migrate north, throughout the spring and summer, from overwintering sites in the southern states. Arriving moths lay eggs on corn leaves. Within 3 to 5 days, the eggs hatch into larvae and move toward the whorl.

### Identification

FAW moths lay eggs on corn stalks and leaves in egg masses of 50-150 eggs<sup>1</sup>. FAW egg masses can be distinguished from others by a layer of moth scales and fine bristles that cover them. Armyworm (AW) and western bean cutworm (WBC) also lay egg masses but they are not covered with a layer of scales and bristles while, corn earworm (CEW) lay single eggs.

Larvae of FAW, AW, CEW, and WBC are often mistaken for each other (Figure 1). Correct identification can impact management decisions. FAW larvae have an inverted Y on their head

capsule and vary from light tan or green to almost black. Four dark spots are arranged in a square on top of the 8th abdominal segment. AW larvae have a gray or greenish-brown head covered with a network of lines. CEW larvae usually have an orange head. WBC larvae are tan with a darker, faint diamond shaped pattern on their back, and dark stripes immediately behind their head.

### Scouting

Early FAW damage appears as 'window panning' and shot-holes in leaves. Damage from larger larvae results in ragged leaves (Figure 2). 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<sup>1</sup>. Determine the percentage of plants damaged by FAW. Pull some whorls and unroll the leaves to make larval counts.

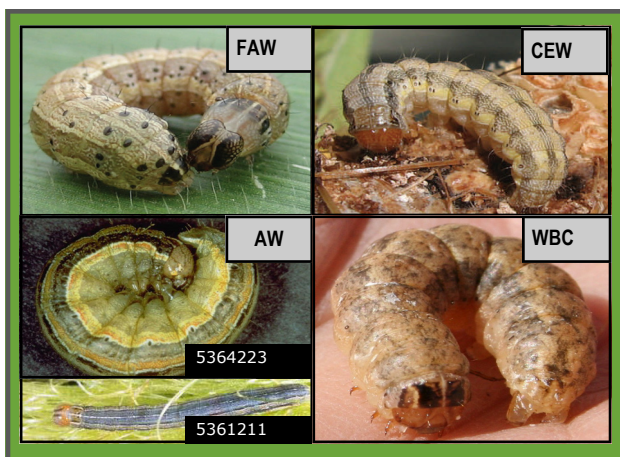


Figure 1. Commonly mistaken larva.



Figure 2. FAW damage on corn with larva in whorl.

▶ from previous page **Fall Armyworm (*Spodoptera frugiperda*) in Corn**

## Management

While YieldGard® Corn Borer technology offered suppression of FAW, Genuity® corn traits can 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™ corn provide dual modes of action and Genuity® SmartStax® corn provides triple modes of action against lepidopteran species such as FAW.

If the corn crop doesn't contain *Bt* traits that offer protection against FAW, an insecticide application may be considered. However, insecticide use to prevent foliar feeding damage is not typically economical and is only recommended to help protect against yield loss due to ear damage. Insecticides should be applied before FAW larvae burrow deep into the whorl or enter ears of more mature plants. The efficacy of the insecticide may not be effective if the larvae are burrowed in the whorl because the frass (larval waste) can block the FAW feeding tunnel. FAW thresholds for insecticide applications are shown in Table 1.

When applying insecticides, your local area agronomist recommends using ground rigs with high volumes (20-30 gpa), set up to direct the insecticide over the row, instead of broadcast. Due to high water volumes needed for adequate control, aerial application is not recommended.

### Table 1. FAW Thresholds for Insecticide Treatment

1. egg masses are found on  $\geq$  5% of the plants <sup>1,2</sup>  
OR
2. 50% of the plants have severe leaf damage <sup>2</sup>  
OR
3. 25% of the plants have leaf damage and live larvae are still present <sup>1</sup>

Source: <sup>1</sup> R. Bessin. 2004. *Fall armyworm in corn. University of Kentucky Extension Entomology. Publication no. ENTFACT-110*; <sup>2</sup>K. L. Steffey and others. 1999. *Handbook of Corn Insects. Entomological Society of America; Additional references used in publication: J. Capinera, 2005. Fall Armyworm. University of Florida. Featured Creatures; J. Obermeyer, and et al. 2002. Fall Armyworm-Like Damage Reported in Corn Whorls. Pest & Crop, Issue 14. Purdue Ext; I. Cruz and F.T. Turpin. 1983. Yield impact of larval infestations of the fall armyworm to midwhorl growth stage of corn. J. Econ. Entomol. 76:1052-1054; Photos: Frank Peairs, Colorado State University, Bugwood.org; Armyworm photos 5364223 and 5361211; University of Georgia Archive, University of Georgia, Bugwood. com; photo1673007*

**Monsanto Company is a member of Excellence Through Stewardship® (ETS).** Monsanto products are commercialized in accordance with ETS Product Launch Stewardship Guidance, and in compliance with Monsanto's Policy for Commercialization of Biotechnology-Derived Plant Products in Commodity Crops. Commercial product(s) has been approved for import into key export markets with functioning regulatory systems. Any crop or material produced from this product can only be exported to, or used, processed or sold in countries where all necessary regulatory approvals have been granted. It is a violation of national and international law to move material containing biotech traits across boundaries into nations where import is not permitted. Growers should talk to their grain handler or product purchaser to confirm their buying position for this product. Excellence Through Stewardship® is a registered trademark of Biotechnology Industry Organization. **B.t. products** may not yet be registered in all states. Check with your Monsanto representative for the registration status in your state. **Individual results may vary**, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** Roundup Ready® crops contain genes that confer tolerance to glyphosate, the active ingredient in Roundup® brand agricultural herbicides. Roundup® brand agricultural herbicides will kill crops that are not tolerant to glyphosate. Genuity and Design®, Genuity Icons, Genuity®, Roundup Ready 2 Technology and Design®, Roundup Ready®, Roundup®, SmartStax®, Technology Development by Monsanto and Design®, VT Double PRO™, VT Triple PRO™, and YieldGard® are trademarks of Monsanto Technology LLC. Ignite® and LibertyLink® and the Water Droplet Design® are registered trademarks of Bayer. Herculex® is a registered trademark of Dow AgroSciences LLC. Respect the Refuge and Corn Design® and Respect the Refuge® are registered trademarks of National Corn Growers Association. All other trademarks are the property of their respective owners.  
©2011 Monsanto Company. EJP061909; AMB051210; AMB071111



Before opening a bag of seed, be sure to read, understand and accept the stewardship requirements, including applicable refuge requirements for insect resistance management, for the biotechnology traits expressed in the seed as set forth in the Monsanto Technology/Stewardship Agreement that you sign. By opening and using a bag of seed, you are reaffirming your obligation to comply with the most recent stewardship requirements.

