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Stalk Borers Moving in Southern Iowa

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Abstract
Tracking degree days is a useful tool to estimate when common stalk borer larvae begin moving into cornfields from their overwintering hosts. Foliar insecticide applications, if needed, are only effective when larvae are migrating and exposed. Start scouting corn for larvae when 1,300-1,400 degree days (base 41°F) have accumulated. Southern Iowa counties reached this important benchmark over the holiday weekend (Figure 1), and therefore scouting for migrating larvae should begin now to make timely treatment decisions. Stalk borer larvae in central and northern Iowa will migrate later in June.

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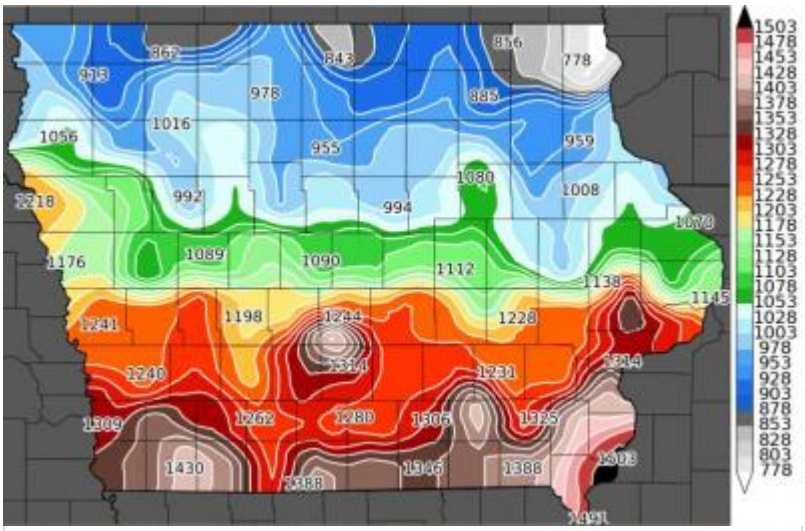

Figure 1. Degree days accumulated (base 41°F) for stalk borer in Iowa (January 1 - May 29, 2017). *Map courtesy of Iowa Environmental Mesonet, ISU Department of Agronomy*

Management

Female moths prefer to lay eggs in weedy areas in August and September, so minimizing weeds (especially giant ragweed) in and around corn during that time will make those fields less attractive. Long-term management requires controlling grassy edges around corn so that females will not lay eggs in that area during the fall. To prevent stand loss, scout and determine the percent of infested plants. Consider applications at peak larval movement, or 1,400-1,700 degree days (base 41°F). The use of an economic threshold (Table 1), first developed by Iowa State University entomologist Larry Pedigo, will help determine justifiable insecticide treatments based on market value and plant stage. Young plants have a lower threshold because they are more easily killed by stalk borer larvae.

Table 1. Economic thresholds (expressed as percent of infested plants with larvae in the whorl) for stalk borer in corn, based on market value, expected yield, and leaf stage.

Market value		$3/bu				$4/bu				$5/bu			
Yield		150	175	200	225	150	175	200	225	150	175	200	225
leaf stage	1	5.80	4.9	4.30	3.80	4.30	3.70	3.20	2.90	3.46	2.97	2.60	2.31
	2	7.10	6.00	5.30	4.70	5.30	4.50	4.00	3.50	4.23	3.63	3.17	2.82
	3	9.30	8.00	7.00	6.20	7.00	6.00	5.30	4.70	5.60	4.80	4.20	3.73
	4	9.90	8.50	7.40	6.60	7.40	6.40	5.60	5.00	5.95	5.10	4.46	3.97
	5	11.30	9.70	8.50	7.60	8.50	7.30	6.40	5.70	6.80	5.83	5.10	4.54
	6	19.80	17.00	14.90	13.20	14.90	12.80	11.20	9.90	11.90	10.20	8.93	7.94
	7	54.70	46.90	41.10	36.50	41.1	35.20	30.80	27.40	32.84	28.15	24.63	21.89

Stalk borers tend to re-infest the same fields, so prioritize those for scouting first with extra attention to the field edges. Applying insecticides to larvae that have entered the stalk is not effective. Instead, target foliar applications to larvae as they migrate from grasses to corn. Look for larvae inside the whorls to determine the number of plants infested. The larvae are not highly mobile and typically only move into the first four to six rows of corn. Look for new leaves with irregular feeding holes or for small larvae resting

inside the corn whorls. Larvae will excrete a considerable amount of frass pellets in the whorl or at the entry hole in the stalk. Young corn is particularly vulnerable to severe injury, but plants are unlikely to be killed once reaching V7.

Using burndown herbicides before corn planting can force stalk borers to move and infest emerging corn. If an insecticide is warranted based on stalk borer densities, the application must be well-timed to reach exposed larvae before they burrow into the stalk. Border treatments should be considered particularly because the infestations are localized. Make sure to read the label and follow directions, especially if tank-mixing with herbicide, for optimal stalk borer control.

Description

Stalk borer larvae have three pairs of true legs and four pairs of fleshy prolegs. The body is creamy white and dark purple with brown stripes. Often there is a creamy white stripe running down the back of the thorax and abdomen. A distinctive feature of stalk borer larvae is an orange head with two dark lateral stripes (Photo 1). The adults are dark grey and brown colored moths, with jagged white lines and two to three clusters of white spots (Photo 2).

Photo 1. Common stalk borer larva. Photo credit Adam Varenhorst.

Photo 2. Common stalk borer adult. Photo credit Adam Sisson.

Biology

Stalk borers have one generation annually in Iowa. Stalk borer eggs are laid on grasses and weeds in the fall and overwinter in this cold-hardy stage. Egg hatch typically occurs around April 19 – June 5, and about 50 percent of egg hatch happens at 494 degree days. Young larvae will feed on grasses and weeds until they outgrow the stem of the host plant. The number of larval molts is variable, depending on food quality, and ranges from seven to nine instars. Migration to larger hosts begins around 1,300-1,400 degree days. Fully developed larvae drop to the soil to pupate. Approximately 50 percent of pupation happens at 2,746 degree days, with 50 percent adult emergence at 3,537 degree days. Peak adult flight occurs during the first two weeks of September.

Corn adjacent to grassy and weedy areas becomes a suitable food source for migrating larvae. The most susceptible corn growth stages for infestation are V1-V5 or about 2-24 inches in plant height. Larvae can defoliate leaves and create non-economic injury. More often, larvae kill corn plants by entering the stalk and destroying the growing point (i.e., flagging or dead heart). A dead heart plant will have outer leaves that appear healthy, but the newest whorl leaves die and can cause barren plants.

Photo 3. Stalk borer larvae can shred corn leaves and destroy the growing point.

For more information on stalk borer biology and management, read a *Journal of Integrated Pest Management* article by Rice and Davis (2010), called "Stalk borer ecology and IPM in corn."

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Dr. Erin Hodgson started working in the Department of Entomology at Iowa State University in 2009. She is an associate professor with extension and research responsibilities in corn and soybeans. She has a general background in integrated pest management (IPM) for field crops. Dr. Hodgson's curre...