

Dectes Stem Borer Management in Soybeans

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Life History and Phenology

The Dectes stem borer (DSB) adult is a long horned beetle, $\frac{3}{8}$ inch long, grey, and with long antennae that are banded black and grey. The legless larvae reach $\frac{1}{2}$ to $\frac{5}{8}$ inch long, are creamy white or yellow in color, and have an “accordion-like” appearance. The DSB is a known pest of soybeans and sunflowers. In addition, it has a number of native host plants including giant ragweed and cocklebur. The adult beetles begin emerging in late June and are present in soybean fields until mid-August, laying eggs in the petioles and stems of soybean plants.

The females lay a single egg into the pith tissue of a soybean plant by chewing a hole through the plant’s epidermis and inserting her ovipositor directly into the plant. If an egg is laid into the stem of a leaf petiole, the petiole will wilt and drop from the plant when the larva hatches and tunnels into the main stem. Typically, there is also a reddish scar where the petiole dropped from the plant.



Scott Stewart, UT

Adult dectes stem borer



Phil Sloderbeck, KSU

Egg laid in the petiole



Scott Stewart, UT

Larva tunneling

Once the egg hatches, the larva tunnels up and down the inside of the soybean plant, feeding on the pith tissue. As the plants begin to senesce, as early as late September, the larva creates a chamber in preparation for overwintering by girdling the inside of the host plant several inches above the soil surface and depositing a frass plug immediately below the girdled area of the stem. The DSB overwinters in the larval form in the chamber it created either at or just below the soil surface. Pupation occurs in early summer, completing the life cycle.

Damage

Significant yield losses from the DSB can be attributed to the overwintering behavior of the larvae which makes the plants prone to lodging. Under heavy pressure and when harvest is delayed, lodging yield losses can be as much as 15 bushel per acre. Physiological losses due to the tunneling activity of the larvae during the growing season has been difficult to document. Recent research has suggested that yield losses can be as high as seven percent.

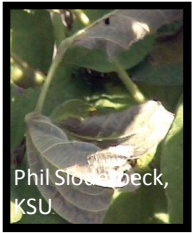


M. Spellman

Lodged soybean plant

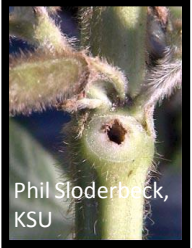
Sampling and Decision Making

Currently, there is not an established threshold for DSB adults in soybeans. Sweep net sampling can be used from late June through mid-August to identify fields that have infestations of DSB adults. Plants can also be visually inspected for oviposition scars: use wilted petioles or reddish scars where the petiole dropped from the plant to identify fields with potential larval infestations.



Phil Sloderbeck,
KSU

Wilted petiole



Phil Sloderbeck,
KSU

Detached petiole

To confirm that a plant is infested with a DSB larva and assess the risk for lodging loss, it should be cut lengthwise with a pocket knife, looking for the larva and or feeding damage by mid-September. Knowing if a field is infested with DSB and the severity of the infestation is important because the field may be prone to lodging and should be harvested in a timely manner to reduce the risk for lodging losses.

Management

Insecticide applications, both foliar and at planting, have not been successful in significantly reducing the damage caused by this pest. The only developmental stage that can be targeted for control is the adult beetle because the eggs and larvae never leave the host plant. Temporary reductions in beetle populations can be achieved with an insecticide application; however, because the adult emergence occurs over a large window, fields can be quickly re-infested. There has also been mixed results with multiple insecticide applications because not only is it difficult to time the applications, it's generally not economically feasible to do so.

Although cultural control practices will not provide 100% control, research results from Delaware and other regions have indicated that with the adoption of a combination of the following cultural control strategies, the risk of yield loss from the DSB can be reduced.



M. Spellman
Larva in split soybean stem

- **Early/Timely Harvest:** Early or timely harvest has been shown to significantly reduce lodging losses. Sampling techniques and field history can be used to identify fields with high infestations of DSB that should be harvested in a timely manner.
- **Crop Rotation:** Adult DSB are not considered “strong” fliers so crop rotation can help in reducing populations. However, unless a field is isolated or this approach is adopted area wide, this strategy may not be effective in reducing DSB populations in regions with significant acreage planted in soybeans.
- **Fall Plowing:** Research has indicated that plowing stubble 2-3” deep can result in up to a 60-70% reduction of adult beetle emergence in the summer.
- **Weed Control:** Giant ragweed, common cocklebur and wild sunflowers are alternative host plants for DSB. Therefore, weed control within and around the perimeter of fields is important.
- **Row Spacing:** In general, the severity of an infestation or number of lodged plants does not appear to be affected by row spacing. However, in fields planted in narrow rows (7-15” row spacing), lodging losses may be reduced because the lodged plants are held up to some degree by the surrounding plants.
- **Variety Selection:** Experience in Delaware has indicated that lodging loss is typically more severe in shorter season varieties (Group II, III and early Group IV’s). Soybean Cyst Nematode (SCN) resistant varieties may have fewer lodged plants compared to SCN susceptible varieties. Field sampling has confirmed that the larvae will infest most varieties; however, some are more prone to lodging, especially in drought situations.