Managing Billbugs in Corn

- Billbugs can cause damage from emergence through 6 to 8 leaf growth stages of corn.
- Adult weevils and grubs feed on corn stems and roots, weakening or killing seedlings.
- Crop rotation and cultural practices that promote rapid, vigorous establishment of corn seedlings are essential elements of billbug management in corn.
- Seed-applied insecticides or banded insecticides can help limit billbug damage to corn.

Billbugs are early season insects in field corn. Southern corn billbug (Sphenophorus callousus) can cause damage from emergence through 6 to 8 leaf growth stages of corn in southeastern production areas. This pest damages corn over the entire Coastal Plain of the southern states and up the Mississippi River valley into the Midwest. Maize billbug (Sphenophorus maidis Chittenden) is a related species that can be a problem in corn.

Billbug Injury to Corn

Corn seedlings are normally vulnerable to adult billbug damage until seedlings reach the 6 to 8 leaf stage of growth, when stem diameter becomes large enough to limit adult feeding on meristematic tissues. Seedlings attacked by billbug adults will show one or more of the following symptoms:

- Feeding slits on the lower stem
- Wilted leaves in the center of the whorl
- Cut-off leaves and plants in small seedlings
- Larger plants that are twisted and suckered
- Leaves with rows of holes in the blades

Immature billbugs (grubs) develop within the root crown area and tunnel into the lower stalk. Plants infested with larvae often show no obvious symptoms but may be more susceptible to drought stress and die prematurely. Damage by grubs may also result in a reduced ear size of up to 40%, depending on time of infestation and other stress factors.

Identifying Billbugs

Southern corn billbug (SCB) adults are weevils with long snouts that are about ½ inch in length. They are generally ash gray or brownish in color and are usually covered with soil dust, giving the insect a soil-like color. Overwintering adults emerge during April and May from litter in fields, ditches, hedgerows, and bordering woods. Adults mainly move by crawling but are capable of flight. Infestations that cause damage to corn are found within a mile of fields where corn was grown the previous season. Weevils can be found feeding on corn stems near ground level. Females lay about 200 kidney-shaped, cream-colored eggs in holes chewed at the base of corn stems.

Larvae are cream colored, 1/8 to 1/2 inch long, and have distinct reddish-brown heads. Eggs hatch in 4 to 15 days and the legless, grub-like larvae migrate down the outside of the stem to feed in roots and tunnel into the lower stalk. Normally there is one larva per cornstalk. The larvae develop in 40 to 70 days and pupate in or around corn taproots with feeding damage. Larvae pupate in the soil during July to September. Adults develop after 1 to 2 weeks of pupation. SCB overwinters as an adult.

Maize billbugs have a similar life history and biology as SCB. The maize billbug is a reddish-brown to black snout beetle (Figure 1). The adult billbug ranges from 3/8 - 1/2 inch long. This beetle hides in the soil during the day and is active at night. The maize billbug overwinters as an adult in soil, grasses, or plant litter, becoming active when corn begins to emerge. This insect moves by crawling but can fly 1/4 mile or more.

Adults feed at the base of corn stalks. Females lay white to gray kidney-shaped eggs about 10 days after feeding begins, in holes they gouge in the plant stem with their mouthparts. These gouges later appear as a transverse row of punctures in the expanded leaves (Figure 2). A single female can lay 200 eggs or more over a two-month period. Eggs hatch in 4 to 15 days, depending on temperature.
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The small, legless grubs feed and develop for several weeks in the center of stalks at ground level. Grubs move into the soil and feed in or around the roots. Pupation occurs in the stems, roots, or soil. There is one generation per year.

Scouting
Billbugs overwinter in field litter, ditches, and hedgerows. Continuous corn, corn fields planted adjacent to corn from last year, and field edges are the most likely to have billbug problems. Scout seedling corn weekly from emergence until plants are at the 6 to 8 leaf growth stage to assess billbug damage, stand loss, and plant population. Adults are more active in the early morning and evening. They usually hide underneath litter and soil during most of the day. Walk a zig-zag pattern over the field looking for insect damaged plants or poor stands. Where insect damage or poor stands are observed, dig up several plants to verify insect damage. If insect damage is confirmed, examine 100 plants in the area and record the number of damaged plants. Continue sampling throughout the field. The economic threshold for billbugs is 5% seedling loss in infested areas with a full plant stand.1 In fields where billbug is most likely, scouting should focus on field edges (up to 150 to 200 feet), bordering fields planted to corn last season and non-rotated corn fields.1 Billbugs may also be found on volunteer corn and yellow nutsedge.

Management Options
Integrated, preventative management tactics are the most effective means for preventing billbug damage to corn because billbug damage occurs in corn seedling development and post-planting rescue treatments are not effective.1 Practices to help manage billbug infestations include:

- Rotate corn with non-grass crops to help reduce infestations. Billbugs can become a yield-limiting problem after 2 or more years of continuous corn.1 Separating corn or sorghum crops can be used to limit billbug infestations. Adults move mainly by crawling but are capable of flight. Most potentially damaging infestations are found within a mile of corn grown the previous season.
- Select corn products with good early-season germination and vigor during cool, moist soil conditions.
- Use seed-applied insecticides or a T-band application of a soil insecticide at the highest labeled rates for billbug.
- Plant early to help corn seedlings develop sufficient size before billbugs become very active.
- Promote rapid, vigorous corn growth by optimizing soil pH and drainage and by using starter fertilizer, appropriate tillage practices to manage residue, and other practices to foster rapid corn growth.
- Control nutsedge and other hosts of billbug in and around fields to reduce feeding and reproduction.
- Over-the-top insecticide rescue treatments are generally ineffective since infestations are generally identified after damage occurs, billbugs are most active at night, or covered by soil or crop residue during the day, and grubs feed inside plant tissues.

Summary
Preventing billbug damage to corn relies on integrated management. Crop rotation and cultural practices that promote rapid, vigorous establishment of corn seedlings are the most critical elements of the plan. Field selection is particularly important in no-till situations where early corn growth can be slow. Rapid, uniform germination and seedling growth can help reduce the time that corn seedlings spend in the most sensitive growth stages for billbug feeding damage and increase tolerance of feeding damage. If corn will be planted in areas with high billbug infestations, a seed-applied insecticide or T-band application of an insecticide may be necessary.

Sources:
Web sources verified 10/12/2015.

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology, Development, & Agronomy by Monsanto.

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