Agronomic Spotlight

Seminis grow forward

Sweet Corn Stalk Quality

- Sweet corn stalk quality can be negatively impacted by insect damage, disease pressure, and poor environmental conditions.
- Although stalk quality is not typically a major problem in sweet corn, maintaining stalk health can also help increase product quality and harvest efficiency.

Impact of Insects

Sweet corn stalk quality may be negatively impacted by several insects, including corn rootworm, lesser cornstalk borer, and European corn borer.

Corn rootworm (*Diabrotica* spp.). Newly hatched larvae feed on root hairs, continuing to tunnel deeper into larger roots as they mature. Roots can be pruned back to the stalk (Figure 1), resulting in heavy damage to plant vascular and structural systems. Weakened root systems may cause plants to lodge, which can interrupt harvest and lower quality.[1]

Figure 1. Root system damaged by corn rootworm.

The larval growth stage of corn rootworm is the most damaging developmental stage to sweet corn. Larvae are roughly 1/2-inch long with a white and slender appearance, a brown head and a brown plate on the end of the body.[2]

Lesser cornstalk borer (*Elasmopalpus lignosellus*). Female moths (Figure 2) lay eggs near the base of corn plants. Larvae feed on leaf tissue before boring into stalks. Small entry tunnels may be found near or slightly below the soil surface. Once larvae have entered the stalk, they become difficult to control. Stalk injury creates an opportunity for stalk rot disease entry.[3]

Figure 2. Lesser cornstalk borer female moth.
Source: Mark Dreilling, Retired, Bugwood.org.

Larvae bodies are roughly 3/4-inch long, dark with purple bands. Infestations tend to occur in well-drained soils and in hot, dry weather. Several generations may be produced within a season.[3,4]

European corn borer (*Ostrinia nubilalis*). Larvae overwinter in corn stalks and other crop residue. First-generation larvae feed on the leaf whorls of young plants, causing a typical "shothole" appearance as the leaves expand (Figure 3). Second-generation larvae tunnel into stalks and ears. Stalk damage disrupts the flow of water, sugars, and nutrients, and can result in broken plants or lodging.[1]

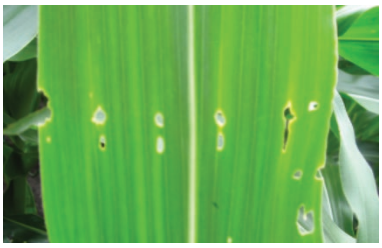

Figure 3. Characteristic leaf damage caused by European corn borer.

Larvae are roughly 1-inch long, creamy white to gray in color with rows of small brown spots running the length of their bodies. Familiarity of moth flights, as well as the use of pheromone and blacklight traps, can help monitor populations of European corn borer.[1,5]

Impact of Diseases

Although most diseases affecting sweet corn stalk quality do not fully develop until after harvest, they are likely present in the field prior to harvest and can negatively impact harvest efficiency and yield potential. Stalk rots may be prevalent in fields that have too much nitrogen coupled with extended periods of wet weather after silking.6 Possible sweet corn diseases that may cause stalk rot in sweet corn include anthracnose; and less often, *Fusarium* and *Gibberella*.

Anthracnose (*Colletotrichum graminicola*). Anthracnose symptoms appear as tan lesions on sweet corn stalks (Figure 4). Pith tissues of internodes are discolored and colonized by the fungus. In some situations, anthracnose stalk rot can develop to severe levels

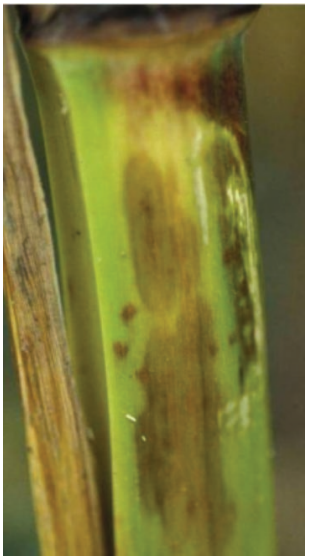

Figure 4. Anthracnose lesions on stalk.
Source: University of Illinois.

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prior to harvest, infecting multiple internodes and increasing the probability of stalk lodging prior to harvest of fresh sweet corn. Colletotrichum can also infect corn leaves at all growth stages, but anthracnose leaf blight does not directly result in anthracnose stalk rot and vice versa. The fungus survives in crop residue and is distributed by wind or rain.[2]

Fusarium (*Fusarium moniliforme*). Often difficult to diagnose, Fusarium stalk rot can infect stalk tissues through injured plants, causing weakened stalks with white to tan to pink discoloration. As this disease is soil-borne, infection may also occur through the roots particularly when fields are wet. Because sweet corn is harvested at the R3 growth stage, it is unlikely that Fusarium stalk rot will develop fully even though the root and crown rot stages may occur. Incidence of disease increases when plants are stressed, with severe cases leading to plant death.

Gibberella (*Gibberella zeae*). Gibberella stalk rot causes a distinct pink to red discoloration in the stalk and small, black fungal structures called perithecia may accumulate near nodes of plants at the R6 growth stage and beyond. Because fresh sweet corn is harvested at the R3 growth stage, fully developed Gibberella stalk rot is unlikely even though initial infection may occur prior to harvest. This fungus is soilborne and can survive in crop residue.[7]

Early death of leaves caused by foliar diseases like southern corn leaf blight can increase susceptibility of sweet corn to stalk rots. This is related to the decrease in photosynthesis caused by diseased necrotic tissue.

Environmental Conditions

In addition to insect and disease damage, several other factors may lead to sweet corn lodging. Root lodging (Figure 5) is a major concern for sweet corn production. Root lodging may occur more frequently in fields that have compacted, water-logged soils in combination with strong winds, or in dry soils that can limit root initiation. Weakened root systems, whether from poor nutrition, insect or nematode damage, or mechanical damage from cultivation, can increase the probability of this type of lodging.

Figure 5. Root lodging.

Management

Increasing sweet corn stalk quality can also help increase sweet corn yield potential and product quality. The following practices can help increase sweet corn stalk quality:

- Apply fertilizer according to soil test results.
- Remove weeds and crop residue that may harbor insects or diseases.
- Select a sweet corn product that is resistant to problem diseases and include a premium seed treatment.
- Early-season sweet corn products can have weaker stalks than mid- or late-season sweet corn products; choose a maturity based on local growing conditions.
- Consider planting an insect-protected sweet corn product that includes protection against European corn borer and corn rootworm.
- Rotate to non-host crops to reduce pest populations.
- Manage water and nutrients throughout the season to limit plant stress.
- Regularly and thoroughly scout for pest problems and apply fungicides and/or insecticides as needed.[1,3]

Sources:
[1] Regional IPM Centers. 2001. Crop profile for sweet corn in Minnesota. USDA Regional IPM Centers Information Network. http://www.ipmcenters.org/.
[2] Field Crops IPM. Corn rootworms. 2009. Purdue University. http://extension.entm.purdue.edu/.
[3] Mossler, M.A. 2014. Crop profile for sweet corn in Florida. University of Florida IFAS Extension. CIR1233. http://edis.ifas.ufl.edu/.
[4] Vegetable Extension Team. 2011. Commercial sweet corn production in Georgia. The University of Georgia Cooperative Extension. Bulletin 1388. http://www.caes.uga.edu/.
[5] Field Crops IPM. 2009. European corn borer. Purdue University. E-Series 17-W. http://extension.entm.purdue.edu/.
[6] Stall, W.M., Waters, L., Davis, D.W., Rosen, C. and Clough, G.H. 1989. Sweet corn production. Purdue University. NCH-43. https://www.extension.purdue.edu/.
[7] Shaner, G.E., and Scott, D.H. 1998. Stalk rots of corn. Purdue University. BP-59. https://www.extension.purdue.edu/.
Web sources verified 06/04/15.

For additional agronomic information, please contact your local seed representative.

Performance may vary from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields. The recommendations in this article are based upon information obtained from the cited sources and should be used as a quick reference for information about sweet corn production. The content of this article should not be substituted for the professional opinion of a producer, grower, agronomist, pathologist and similar professional dealing with this specific crop.