Agronomic Spotlight

Causes and Effects of Spongy Corn Cobs

- Corn plants pull sugars from stalks and cobs to enable grain to fill. Sugars from green leaves replenish these supplies.
- Poor roots due to excessive rainfall, drought, and diseases may contribute to early corn stalk and canopy deterioration late in the season, which can lead to development of spongy cobs.
- Farmers should adjust combines to improve removal of grain from soft cobs.

Symptoms at Harvest

Even in some fields with good grain quality and yield potential, cobs are breaking while going through the combine, and some grain is remaining on broken cob pieces. The results can be increased loss of grain at harvest and the potential for grain drying challenges when cob pieces wind up in the grain bin. Some fields, or spots in fields, are affected while others show no symptoms. Fields or portions of fields with higher yield potential (greater demand for nutrients and sugars) may be more likely to produce spongy cobs.

Potential Causes

Plentiful early rainfall across the Corn Belt resulted in shallower than desired root systems. This lowered the ability of plants to take up water and nutrients, particularly nitrogen, during warm, dry periods later in the summer. High temperatures and drought at the end of the grain-filling period further stressed corn plants. Diseases such as anthracnose, northern corn leaf blight, red root rot, rust, gray leaf spot, and others may have also accelerated leaf loss and stalk deterioration.

Figure 1. Spongy cobs that break easily in the combine often also have excellent grain-fill.

"Grain is an aggressive sink that will take sugars in from wherever it can take them," says Emerson Nafziger, Professor, Department of Crop Sciences, University of Illinois. "Under stressful conditions, we know that grain will pull sugars from the stalk. Where we are seeing soft cobs that don't seem to be from disease, we suspect that the grain might have drawn sugars from the cob more than it normally does, resulting in the sort of deterioration in the cob that we normally see in the stalk when there is late-season stress." (E. Nafziger, personal communication, September 21, 2015).

Nafziger notes that the corn canopy in many areas deteriorated more rapidly than normal this season. "At the end of August, the tops of plants in many fields were not the nice, green color we would like to see as we approach maturity. When the canopy deteriorates before maturity, sugars move from the stalk and set the crop up for stalk quality problems. I have not seen a lot of standability issues this year."

Figure 2. Deteriorated stalks indicate that corn plants have pulled sugars from the stalks to facilitate grain-fill.

"Depending on how quickly and when the canopy sugar supply was cut off, some fields might show more soft cobs than soft stalks, since kernels can draw sugars from the closest source, and early death might have cut off the supply from the stalks," Nafziger says. Both spongy cobs and weak stalks are an indication that corn plants died prematurely, but the pattern might have been unusual with the environmental issues in (excess water, disease, heat, drought, nutrient loss), and the corn plant's natural ability to draw sugars from other plant parts to facilitate grain-filling.

Figure 3. Spongy cobs are likely caused by a combination of environmental stresses.

Management

Adjusting combine concaves and rotor speeds can help facilitate grain removal from spongy cobs. Moving grain through an auger or screen, or perhaps through a flow-through dryer, might help separate kernels from cob pieces. Always refer to the manufacturer's manual before performing any maintenance.