



Corn Stalk Rots in Minnesota This Year

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The corn crop generally looks good across Minnesota this year, however, a problem may be lurking in many fields that may reduce yields and set the stage for lodging and harvest challenges. This problem is corn stalk rots, a common problem that is increased by stress conditions in the mid to late growing season. Corn stalk rot has been reported this season in many areas of the state but particularly in areas which suffered from drought stress and/or corn rootworm damage earlier in the season. General information about corn stalk rots and a perspective on this problem for Minnesota are addressed in this article.

Corn leaves changing from to dull green or gray is often an early symptom of severe stalk rot. Wilting, straw or black-colored lower stalks, discoloration and decay of internal pith tissue, and drooping of the ears may occur as the stalk rot develops. Stalk rot shouldn't be confused with innocuous purple leaf sheath, which is seen as irregular-shaped purple to brown discolored patches on and under leaf sheaths caused by fungi and other microorganisms growing on pollen and other nutrients trapped between the stalk and leaf sheath.

Conditions have occurred in Minnesota this summer that may result in increased corn fungal stalk rots. But why may stalk rots be a problem this year in many fields? Plants under stress are more susceptible to stalk rot. The pathogens that cause most stalk rots

tend to be widespread fungi that take advantage of plants weakened by various stresses. These may include water stress, susceptible hybrids, root damage, leaf disease, conservation tillage, high plant populations, insect damage, early maturation, low N in mid to late summer, high fertility- especially very high N, and low P and K.

In addition to these potential stress factors, high yield environments can increase stalk rots. For example, large ears require much energy and nutrients to fill the kernels, however, stress conditions that reduce photosynthesis and carbohydrate production by the plants may cause a shift of nutrients from the stalk to the ears, resulting in stalks more susceptible to stalk rots. No-till environments and continuous or short rotations out of corn favor survival and infection by the stalk rot pathogens because the pathogens survive in corn residue on or near the soil surface.

Stalk rot is decay of internal stalk tissues caused primarily by different types of fungi including *Colletotrichum* (Anthracnose), *Giberella*, and *Fusarium*. Charcoal rot and Diplodia stalk rots are important stalk rots that are common in states south of Minnesota, but these as well as Pythium and bacterial stalk rots could also occur occasionally in Minnesota.

Anthracnose stalk rot often appears prior to normal senescence, which is earlier than most other common types of stalk rots. It can cause a top die-back of the stalk which can be confused with early dry-down. In this phase the plant is killed from the top down as the fungus progressively colonizes the stalk. Also, unlike most stalk rots, anthracnose causes development of a black color on the outer surface of the stalk and may cause rot of several internodes. The black, blotchy lesion areas on the stalk surface cannot be scraped away with a thumbnail.

Fusarium stalk rot often occurs late in the season. Yield loss may be more related to corn lodging and broken stalks than poor ear development. *Fusarium* stalk rot can be distinguished by a whitish-pink to salmon discoloration of the internal stalk tissues. Symptoms of *Fusarium* stalk rot can easily be confused with *Gibberella* stalk rot, which

produces a pink to reddish discoloration of the internal stalk tissues. Rotting commonly affects the roots, crown and lower internodes. A diagnostic sign of *Gibberella* is the presence of small, black specks (perithecia) on the surface of the stalk rind and frequently clustered near the nodes. The perithecia may be easily scraped away from the rind tissues with the thumbnail. The fungus that causes *Gibberella* stalk and ear rot also can cause head scab of wheat and barley.

Consider scouting fields for stalk rots. Test 20 plants in five different parts of a field with the “pinch” or “push” test. For the “pinch test”, the lower internode will easily compress when pinched firmly. For the “push test”, stalks will break or remain bent over when pushed 10” to the side at ear height. If 10-15% of plants in a field have stalk rot, then the potential for significant lodging is high and early harvest should be considered.

Stalk rot damage is difficult to manage but can be minimized by reducing as many stresses on the corn crop as possible throughout the growing season and by harvesting early to minimize losses. Corn growers should select hybrids that have stalk rot and leaf disease resistance, good standability, and high yield potential. Balanced soil fertility, control of corn borers and corn rootworms, and appropriated plant populations, as may be suggested with particular hybrids, are also important in reducing stalk rots.