

INTEGRATED CROP MANAGEMENT

Crown rot symptoms common in corn

The seedling disease problems that have plagued some fields in Iowa have evolved into crown rot problems. Seedling pathogens can rot seeds, prevent emergence, and kill emerged seedlings, but some infections are not lethal and the surviving plants are stunted. As healthy nodal roots develop, many of these plants should recover. However, it has become clear that some plants are not recovering and remain stunted. Symptoms of crown rot are observed with many of these stunted plants. Plants were stunted and yellowed even with relatively mild crown decay. Some of these plants also show leaf chlorosis typical of potassium (K) deficiency (see [Corn leaf potassium deficiency symptoms](#) [1] and [Is it iron or potassium deficiency?](#) [2], this issue). There are several possible causes of K deficiency symptoms; one of them is lingering fungal infection of the root and crown tissue.



These corn plants were stunted and yellowed even with relatively mild crown decay.

[Enlarge](#) [3]



Dissected corn plant showing symptoms of Fusarium crown rot.

[Enlarge](#) [4]

These infections usually are caused by *Fusarium* species, but *Colletotrichum* (the fungus that causes anthracnose) can sometimes be isolated from decayed crowns. Several species of *Fusarium* can commonly be isolated from crowns of corn plants at any growth stage. The presence of *Fusarium* is indicated by a tan-to-brown discoloration that sometimes is not distinguishable from an uninfected plant. In mild infections, there are usually no other symptoms. In other infections, the discoloration is more severe and the crown tissue can become substantially rotted. These plants can exhibit stunting, leaf discoloration (yellowing or purpling), wilting, and even death. In a field, the first indication may be patches of uneven plant growth, often (but not always) in areas where the soil remained wet for a long time during the spring. Extensive decay of this part of the plant cuts off the connection between leaves and roots and/or directly destroys the growing point.

Stressful growing conditions cause the plants to become more susceptible to this type of infection. These stresses may include wet soils, cold temperatures, soil compaction, fertility problems, or herbicide injury. In previous years, such problems were most evident when a

wet spring was followed by an extended dry period. This year, it seems that extended cold soils are the most likely stress factor that has led to increased crown rot susceptibility. For the past couple of weeks, Dr. Doug Jardine has mentioned this problem in the [Kansas State University Extension Crop Disease Alert](#) [5] newsletter and in Kansas, Dr. Jardine reports that the crown decay is directly linked to cold weather stress.

Because *Fusarium* species are so common in crop residue and soil, and resistance to this type of infection is not available, there are few practical control measures. Fungicidal seed treatment does not persist long enough to help in this situation. Crown rot is always associated with some type of stress and the plant symptoms are due to a combination of factors, not just the fungal infection. If predisposing stresses can be identified, alleviating them reduces losses to *Fusarium*. In plants that are stunted but with crowns that are not totally destroyed, cultivation may promote development of the nodal root system and help the plants recover. Most plants with crown rot will survive to set an ear, but their yields are likely to be reduced.

Finally, it is my observation that fields with crown rot problems often end up with stalk rot problems later, as the same *Fusarium* species found in the crowns in June can persist and cause stalk rot in September.

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<http://www.ipm.iastate.edu/ipm/icm//ipm/icm/2002/7-1-2002/crownrot.html>

Links:

[1] <http://www.ipm.iastate.edu/ipm/icm/cornleaf.html>

[2] <http://www.ipm.iastate.edu/ipm/icm//ironork.html>

[3] http://www.ent.iastate.edu/imagegal/plantpath/corn/fusarium/munkcrown_rot_mild.html

[4] <http://www.ent.iastate.edu/imagegal/plantpath/corn/fusarium/0796.71fuscrownrot.html>

[5] <http://www.oznet.ksu.edu/path-ext/>

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