



# Agronomic Alert

## Anthracnose Diseases of Corn

- Anthracnose in corn can be present as a leaf blight, top die-back, or stalk rot.
- While leaf blight indicates that the pathogen is present in a field, it does not mean that the stalk rot phase will occur; however, if the leaf blight phase is present monitor fields for the development of stalk rot.
- The majority of lost yield potential from anthracnose can be attributed to premature plant death that interrupts grain fill and lodging that leads to harvest complications and potential grain loss.

### Disease Development

Anthracnose is caused by the fungus *Colletotrichum graminicola*. This fungus overwinters on corn residue. Spores spread to growing plants by windblown rain and rainsplash. Anthracnose is favored by warm, moist weather. Disease severity can be increased during extended periods of low light intensity (e.g. overcast conditions) and high humidity.

High yield potential and/or other stresses are often associated with stalk rots such as anthracnose. This is because roots and stalks may be forced to remobilize their stored nutrients to provide for the grain which is the primary sink. High yield potential creates a larger sink. Stresses such as foliar diseases, insect damage, drought, and cloudy weather decrease the amount of energy and nutrients the plant can produce for grain fill. Consequently, the plant must pull carbohydrates from other tissues. This cannibalization weakens stalks and roots, making the plant more susceptible to stalk rots.

### Symptoms

**Leaf Blight Phase.** Lesions of the leaf blight phase are non-descript, oval- to spindle-shaped necrotic areas that also may appear water-soaked or chlorotic (Figure 1). Lesions are often found on the bottom leaves first and can progress to the upper leaves. Small, black, hair-like fungal structures called setae often occur in necrotic tissues and can be seen with the aid of a



Figure 1. Foliar symptoms typical of the leaf blight phase of anthracnose.



Figure 2. Photo above shows the comparison of a pith infected with anthracnose (top) to a healthy pith (bottom). Photo to the right shows a corn plant exhibiting top die-back.



hand lens. Lesions are often tan to brown with yellow to reddish-brown borders. Heavily infected leaves wither and die.

**Top Die-Back.** In fields with heavy anthracnose stalk rot pressure, it is common to observe that a portion of the plant above the ear dies prematurely while the lower plant remains green. This symptom, known as top die-back, may appear as early as 1 to 3 weeks after tasseling (Figure 2).<sup>1</sup> As the stalk rot phase progresses, the pith and the vascular system becomes rotted, reducing the water translocation to the top leaves. In cases where water availability is reduced in the soil, those top leaves tend to dry down and die as a consequence of reduced water supply.

**Stalk Rot Phase.** Root infection by *C. graminicola* is more likely to lead to the stalk rot phase of the disease than foliar infection.<sup>2</sup> Early infection may kill plants before pollination, but onset usually occurs just before plants mature. Usually, the entire plant dies and several nodes are rotted. Late in the season, generally after plants show signs of early death, a shiny black discoloration develops in blotches or streaks on the stalk surface, particularly on lower internodes. Internal stalk tissue may become discolored and soft, starting at the nodes (Figure 3). Stalks may also have discolored pith while the rind remains green. Lodging typically occurs higher on the stalk than with other stalk rots.

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Figure 3. Symptoms of anthracnose stalk rot include early plant death, shiny black blotches or streaks on the stalk surface, particularly on lower internodes. Additionally, internal stalk tissue may become black and soft, starting at the nodes.

## Management Options: Mid-Season

Some fungicides are labeled to help control the leaf blight phase of anthracnose. **ALWAYS REMEMBER TO READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** It is important to check the fungicide label for control of anthracnose as well as application rate and timing restrictions. Generally fungicides will not control the stalk rot phase of anthracnose. However, fungicides can help maintain plant health, which can cause the corn to be less susceptible to stalk rot pathogens in general.

## Management Options: Prior to Harvest

Plants severely damaged by the stalk rot phase are unlikely to remain standing until the normal harvest period. Therefore, preparations should be taken to harvest problem fields early. Although high grain drying costs may be a concern when harvesting wet grain, this expense will likely be a better option compared to the loss of yield potential due to increased lodging later in the fall. Scouting fields for potential stalk lodging can be broken down into two methods.

**The Push Test.** At several locations in a field select ten plants in a row and push each stalk 45 degrees from upright. If more than 10% of the stalks lodge when pushed, that field may need to be slated for an early harvest.

**The Pinch Test.** Examine the lower nodes of ten plants in a row in several places in the field. Squeeze or pinch each stalk a couple of nodes above the ground. If more than 10% of the stalks collapse easily when squeezed, that field may need to be slated for an early harvest.

## Management Options: Next Season

**Tillage.** Burying infected residue can help decrease inoculum.

**Crop Rotation.** Planting a non-host crop, such as soybeans, can help reduce inoculum. In fields with a severe anthracnose problem a two-year rotation away from corn might be considered.<sup>3</sup>

**Product Selection.** Corn products are often given ratings for tolerance to the leaf blight phase as well as the stalk rot phase. Tolerance to one phase does not indicate that the product will have tolerance to the other phase.

**Minimizing Stress and Cannibalization.** Stalk rots can become more prevalent as a corn crop endures additional stress. Stresses such as foliar diseases, insect damage, drought, and others can increase the risk of stalk cannibalization which can increase the risk of stalk rots.

**Fertility.** Stalk rots can be more common and severe in fields with imbalanced and increased fertility. Plants grown in fields with an imbalance between nitrogen and potassium are very susceptible to stalk rots such as anthracnose.

### Sources:

<sup>1</sup> Stack, J. Anthracnose. University of Nebraska-Lincoln. <http://pdc.unl.edu> (verified 6/19/14).

<sup>2</sup> Morrison, J. 2010. Anthracnose in corn. University of Illinois Extension. <http://web.extension.illinois.edu> (verified 6/19/14).

<sup>3</sup> Lipps, P. and Mills, D. Anthracnose leaf blight and stalk rot of corn. The Ohio State University Extension. Report no. AC-0022-01. <http://ohioline.osu.edu> (verified 6/19/14). Compendium of Corn Diseases 3rd edition. 1999. APS Press. Corn stalk rots. 1995. RPD No. 200. University of Illinois Extension.

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

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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