



## Anthracnose Diseases in Corn

Anthracnose in corn can be present as leaf blight, top die-back, or stalk rot. Closely monitor fields with leaf blight should conditions favor development of the stalk rot phase of anthracnose.

### Disease Development

Anthracnose is caused by the fungus *Colletotrichum graminicola* which overwinters on corn residue. Spores spread to growing plants by windblown rain and rain splash. Disease severity can be increased during extended periods of low light intensity (overcast conditions) and high humidity.

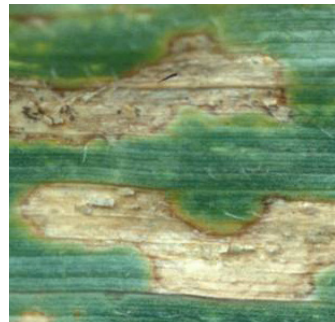
High yield potential, though desirable, can also stress plants and be associated with stalk rots. This is because roots and stalks may be forced to remobilize their stored nutrients to provide for the grain, which is the primary sink. High yield potential creates a larger sink. Stresses such as foliar diseases, insects, drought, and cloudy weather decreases the amount of energy and nutrients the plant produces for grain fill. Consequently, the plant must pull or cannibalize carbohydrates from stalks and roots, and plants become more susceptible to stalk rot.

### Different Phases of Anthracnose

**Leaf Blight Phase** - Lesions are nondescript, oval to spindle-shaped necrotic areas that may appear water-soaked or chlorotic. 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 help of a hand lens (Figure 1). 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 ears dies prematurely while the lower plant remains green.

This symptom, known as “top die-back”, may appear as early as one to three weeks after tasseling (Figure 2)<sup>1</sup>. As the stalk rot phase progresses, the pith and the vascular system decay, reducing water translocation to the top leaves.



**Figure 1. Anthracnose leaf blight with setae in lesions.**



**Figure 2. Top dieback phase of Anthracnose.**



**Figure 3. Comparison of diseased pith on top and healthy pith on the bottom.**



**Figure 4. Symptoms of Anthracnose stalk rot phase include shiny black blotches streaked on the stalk surface. Internal stalk tissue may become black and soft, starting at the first and/or second node.**

In cases where water availability is reduced in the soil, top leaves tend to dry down and die because of reduced water supply.

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**Stalk Rot Phase** - Disease onset usually occurs just before plants mature. Typically, the entire plant dies, and several nodes have rotted. Late in the season, 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 (Figures 3 and 4).

Stalks may also have discolored pith while the rind remains green. Lodging typically occurs higher on the stalk than with other stalk rots.<sup>2</sup>

## Management Options

**Mid-Season** - There are fungicides available to help control the leaf blight phase of anthracnose. Carefully read the fungicide label to that it is for the control of anthracnose as well as for the proper application rate and timing restrictions. Delaro® fungicide has unmatched preventive and curative defense against yield-robbing diseases such as anthracnose leaf blight, gray leaf spot, northern corn leaf blight, and southern rust. Refer to this link for more details about Delaro fungicide: <https://www.cropscience.bayer.us/products/fungicides/delaro>. Fungicides can help maintain plant health, reducing susceptibility to stalk rot pathogens in general. Follow all individual product label instructions for proper application timing, application volume, application equipment, environmental, and harvest interval precautions.

**Prior to Harvest** - Plants severely damaged by the stalk rot phase may become lodged prior to the normal harvest period. Therefore, preparations should be taken to harvest problem fields early. Although high grain drying cost may be a concern when harvesting wet grain, this expense may be a better option when compared to the potential loss of yield due to increased lodging later in harvest. Scouting for stalk rots should be done 40 to 50 days after pollination and before black layer develops. Healthy stalks should be firm, and soft stalks may be diseased. Two methods used to scout for stalk rots:

1. **The push test-** Randomly select 20 plants from five different areas of field for a total of 100 plants. Push the top portion of the plant 6-8 inches (15-20 cm) from the vertical to 45° and note whether the plant lodged or not.
2. **The pinch or squeeze test-** Randomly select 20 plants from five different areas of field for a total of 100 plants. Remove lower leaves and pinch or

squeeze the stalks above brace roots. Record the number of rolled stalks.

In both methods, if 10%-15% of plants lodge or are soft, consider harvesting the field early.<sup>3</sup>

## Next Season

**Tillage-** Bury infected residue can help decrease the amount of disease inoculum.

**Crop Rotation-** Plant 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 a consideration.<sup>4</sup>

**Product Selection-** Select corn products rated well for tolerance to anthracnose. Corn products may have ratings of tolerance to the leaf blight phase and the stalk rot phase of anthracnose. Tolerance to one phase does not indicate that the product has tolerance to the other phases. Ask your seed supplier for locally-adapted products that have good tolerance ratings.

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

**Fertility-** Stalk rots can be more common and severe in fields with key nutrient imbalances, low fertility levels, or low soil pH. Plants grown in fields with an imbalance between nitrogen and potassium are very susceptible to stalk rots.

## Sources

<sup>1</sup>Stack, J., and Jackson-Ziems, T. Anthracnose. University of Nebraska-Lincoln. <https://cropwatch.unl.edu/plantdisease/corn/anthracnose>

<sup>2</sup>Schuster, J., and Pataky, N. 2020. Anthracnose Diseases. Focus on plant problems. University of Illinois Extension. <https://web.extension.illinois.edu/focus/index.cfm?problem=anthracnose-diseases>

<sup>3</sup>2009. Agronomy Guide for Field crops. Ontario Ministry of Agriculture, Food, and Rural Affairs. Pub 811. <http://www.omafra.gov.on.ca/english/crops/pub811/pub811.pdf>

<sup>4</sup>Lipps, P. E., Mills, D. R. Anthracnose leaf blight and stalk rot of corn. The Ohio State University. AC-0022-01. <https://www.knowmoregrowmore.com/wp-content/uploads/2013/07/0022.html>

## Legal Information

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. 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.

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