Anthracnose Disease 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. Much of lost yield potential from anthracnose can be attributed to premature plant death that interrupts grain fill and lodging that leads to harvest loss and complications.

WHAT TO CONSIDER

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 and/or other stresses are often associated with stalks 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 decrease the amount of energy and nutrients the plant produces for grain fill. Consequently, the plant must pull or cannibalize carbohydrates from stalks and roots, making the plant more susceptible to stalk rot.

YIELD IMPACT

Leaf Blight Phase. Lesions of the leaf blight phase are non-descript, oval – to spindle-shaped necrotic areas that 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 hand lens. Lesions are often tan to brown with yellow to reddish-brown borders. Heavily infected leaves wither and die.

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

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 1 to 3 weeks after tasseling (Figure 2).[1] 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 because of reduced water supply.

Stalk Rot Phase. Disease onset usually occurs just before plants mature. Usually, the entire plant dies and several nodes are 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

Figure 2. Top-Left, comparison of diseased pith on top and healthy pith on the bottom. Right is the top dieback phase of anthracnose.

Figure 3. Symptoms of anthracnose stalk rot phase include early plant death, shiny black blotches streaked on the stalk surface. Internal stalk tissue may become black and soft, starting at the first and/or second node.

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.[2]

MANAGEMENT OPTIONS

Mid-Season. Some fungicides are labeled to help control the leaf blight phase of anthracnose. It is important to read the fungicide label to make sure that it is for the control of anthracnose as well as the proper 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 plant to be less susceptible to stalk rot pathogens in general.

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 fields for potential stalk lodging can be broken down into two methods:

- **The Push Test**. In several locations select 10 corn plants in a row, in several locations in the field, 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 adjacent plants several places in the field. Squeeze or pinch each stalk a couple of nodes above the ground. If more than 10% of the corn stalks collapse easily when squeezed, that field may need to be slated for an early harvest.

Next Season.
Tillage. Burying infected residue can help decrease the amount of disease 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 a consideration.3

Product Selection. Corn products are often given ratings for tolerance to the leaf blight phase as well as 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.

Minimizing 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
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