

Corn Stalk Rot Identification and Scouting

Stalk rot of corn tends to be a complex of several disease-causing fungi. It is common for multiple causal organisms to be isolated from a single disease sample. Plants with a rotted stalk often have diseased roots and crown. Usually, the same causal organism is involved. Fields where stalk rot is developing should be identified and targeted for early harvest to minimize grain losses.

Pathogens and Environment

Stalk rots are favored by good growing conditions early in the season, followed by stress after pollination. Stresses can include a lack of moisture, nitrogen deficiency, foliar disease, hail damage, and prolonged cool, cloudy weather conditions. Extended periods of very dry or wet weather prior to pollination, followed by abrupt changes including the stresses mentioned above, for several weeks after silking favor the development of most stalk rot fungi. Fungi that commonly cause stalk rots include *Colletotrichum graminicola* (the causal agent of anthracnose), *Stenocarpella maydis* (also known as *Diplodia*), *Fusarium moniliforme*, and *Gibberella zeae*.

Anthracnose Stalk Rot

Symptoms usually occur just before plants mature. Sometimes a portion of the plant above the ear blanches and dies prematurely (top dieback). More often, the entire plant is killed and several nodes are rotted. Late in the season a shiny black discoloration develops in blotches or streaks on the stalk surface, especially on lower internodes (Figure 1). Internal stalk tissue may become black and soft, starting at the nodes. Lodging typically occurs higher on the stalk than with other stalk rots.

Diplodia Stalk Rot

Lower internodes become straw-brown, spongy, and dry. Pith tissues disintegrate, leaving vascular strands intact. White fungal mycelium may appear on the stalk surface. Tiny, dark fungal structures called pycnidia form just under the stalk surface. These pycnidia are difficult to remove and cannot be easily scraped off.

Fusarium Stalk Rot

Infection commonly leads to rotting of roots, crown, and lower internodes. Stalks prematurely dry down and are susceptible to breakage. When stalks are split, a whitish-pink to salmon discoloration may be visible. Disintegration of internal stalk tissues begins at the nodes (Figure 2).



Figure 1. Stalk rot symptoms. Anthracnose (left) - note the shiny, dark black blotches commonly seen on the rind of infected stalks. Diplodia (right) - symptoms include dark gray discoloration on stalk and the presence of pycnidia as indicated by the yellow arrow. This stalk is also exhibiting symptoms of anthracnose as noted by the red arrow.

to pg. 2 ▶

Corn Stalk Rot Identification and Scouting

▶ from previous page

Gibberella Stalk Rot

Affected plants may wilt with leaves turning a dull gray-green. The lower stalk softens and becomes straw colored as plants die. Pith tissue disintegrates, leaving only vascular strands intact. The inside of a rotted stalk has a pink to red discoloration. Small, dark fungal bodies called perithecia form on the surface of the lower stalk. These perithecia are superficial and can be easily scraped off the stalk.

Scouting

Now is the time to begin scouting fields to identify stalk rots and fields with the potential to have stalk lodging. Do not assume that late planted fields can be harvested late. Because of the wet spring and dry conditions this summer, fields that were planted late may be on target for a normal or even early harvest. When scouting, different hybrids and fields with different management practices should be evaluated separately.

About 40-50 days after pollination, scout fields for visual symptoms of stalk rot such as discoloration on stalks or early drydown. Walk a zigzag pattern through the field and test stalk firmness by squeezing or pinching each stalk a couple of nodes above ground level. Healthy stalks are firm and cannot be compressed. If a stalk feels soft, it is rotted and likely prone to lodging. Check at least 100 plants per field. If more than 10-15% of the stalks in a field are rotted, significant lodging is possible¹.

A second method for determining potential stalk lodging is to randomly select ten plants in a row and push each stalk 45 degrees (or about 5 to 8 inches) from upright. Repeat at ten different locations within a field. If more than 10-15% of the stalks lodge or feel spongy, then the field should be slated for early harvest².

In summary, the combination of a wet spring and dry summer has predisposed corn plants to be susceptible to stalk rots. Take the time to scout fields, regardless of when they were planted. Identify which fields may develop lodging issues and target these for an early harvest to help prevent potential harvest losses.



Figure 2. Stalk rot symptoms. *Fusarium* (left) - typical symptoms include disintegration of internal tissues beginning at the nodes and rotted crown. *Gibberella* (right) - disintegration of pith tissues and characteristic pink to red discoloration can be seen when stalks are split.

Sources: ¹Munkvold, G. 2002. Time to start scouting for corn stalk rot. Integrated Crop Management. Iowa State University Extension. [Online] <http://www.ipm.iastate.edu>. (Verified 9/1/11); ²Vincelli, P. and Herrshman, D.E. Corn stalk rots. PPA-26. University of Kentucky. [Online] <http://www.ca.uky.edu>. (Verified 9/1/11). Additional sources: Compendium of corn diseases. APS Press.

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.

ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS. Technology Development by Monsanto and Design® are trademarks of Monsanto Technology LLC. All other trademarks are the property of their respective owners. ©2011 Monsanto Company. MEA090111