



Stalk Rot in Corn

What is Stalk Rot?

Corn stalk rot is a family of diseases caused by several species of fungi and bacteria. Severity of the disease changes from year to year due to climatic conditions, agricultural practices, hybrid genetics and stresses such as available water, fertility, plant population, foliar diseases, insect damage and weed competition. Stalk rot causes internal decay and discoloration of stalk tissues which directly reduces yield and standability by impairing water and nutrient uptake which can result in lodging and pre-mature death.

What Are Some Stalk Rot Symptoms?

The two most striking external symptoms are pre-mature death and stalk lodging. Visually, the leaves may appear to turn dull to grayish green while stalks, depending on which stalk rot is developing, may show brown or black or pinkish-red internal and/or external discoloration. A major portion of the pith tissue is usually destroyed and the remaining strands of vascular bundles inside the stalk are usually discolored. Advanced stages of stalk rot leave the stalk spongy, soft and hollow.

When is a Corn Plant Most Susceptible to Stalk Rot?

Stalk rot, in one form or another, can attack the plant as early as the seedling stage or any time thereafter. The seriousness of stalk rot is dependent on the types of stresses and the timing when these stresses impact the plant. To date, no true stalk rot resistant hybrids are available however; hybrids vary greatly in tolerance to stalk rot. Foliar diseases increase the severity of stalk rot by impairing leaf tissue thus reducing the amount of photosynthetic activity that can be done by the plant for nutrient manufacture, grain production and across-the-board survival. Yield is reduced because the plant draws on stored nutrients in the stalk for survival which otherwise would have been used for grain fill / production.

What Are Some of the Most Common Stalk Rots?

Fusarium Stalk Rot is one of the most common stalk rots. Its pathogen survives on crop residue and in the soil. *Fusarium* infects the plant by the pathogen being splashed on the leaf and washing down the leaf into the sheath and infecting at the nodes. It can also infect directly through the roots causing decay in the roots or lower stalk. Wounds from hail or insect feeding can provide additional sites of entry. *Fusarium* stalk rot along with *Gibberella* stalk rot produces a reddish-pink discoloration on the internal stalk tissue.



Fusarium Stalk Rot



Gibberella Stalk Rot, which is a pinkish color too, also survives on plant residue or in the soil. Wind blown spores are dispersed to stalks and infect by direct penetration. Infection may also occur through the roots, wounds on the stalk and leaf scars. The spores can also be splash-dispersed and infect the ears and kernels.



Gibberella Stalk Rot

Diplodia Stalk Rot usually occurs three to six weeks after silking. It is distinguished by internal brown stalk discoloration and dry rot in the lower two internodes of the plant. The pith tissue is usually shredded and black spore forming structures are commonly found on the surface of the lower stalk. Spores can be transferred by wind, rain and insects. As the disease progresses, small brown / black reproductive structures form on the stalk surface near the nodes.



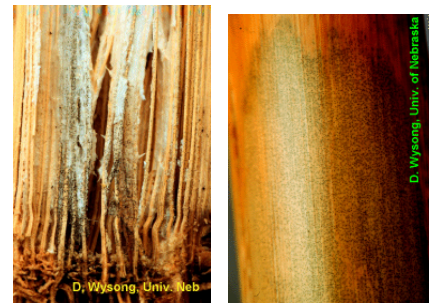
Diplodia Stalk Rot

Anthracnose Stalk Rot has three components (A) leaf blight (B) stalk rot (C) top die back. Prolonged periods of high temperatures and humidity are conducive to this stalk rot. Top die back occurs mid to late summer and affected fields appear to have a green band across the middle of the plants because the lower leaves are drying up due to normal senescence and the upper leaves are dying from anthracnose. Anthracnose has black discoloration on the inside of the stalk as well as on the surface.



Anthracnose Stalk Rot

Charcoal Stalk Rot is caused by a fungus which attacks the roots, enters the crown and eventually disintegrates the pith leaving only the vascular bundles. Numerous small dark specks called sclerotia form on the bundle strands and can easily be seen when the stalk is split. Sclerotia develop in dry areas where soil temperatures are high and soil moisture is low.



Charcoal Stalk Rot

Pythium Stalk Rot occurs under warm wet conditions. Unlike most stalk rots which occur after tasseling, Pythium stalk rot can appear at any time. The rind and pith may become soft, brown and water-soaked and the decayed tissue may have a strong odor. The stalk typically twists and falls over, but the plant may remain green for several weeks because the vascular tissue is not destroyed. Pythium stalk rot may also cause top die back.