

Diplodia Stalk & Ear Rot

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Diplodia stalk and ear rot are caused by the fungus *Stenocarpella maydis*. In 2013, the Corn Disease Working Group estimated that the corn producing regions of the United States and Ontario, Canada had losses of 7.9 and 12.0 million bushels of corn from the *Diplodia* stalk rot and ear rot phases of the disease, respectively. Both stages of the disease occur in Kansas with the ear rot phase being more frequent and important than the stalk rot phase. Incidence of *Diplodia* ear rot within individual fields can be greater than 20% when the environmental conditions are favorable in Kansas.

Symptoms

Diplodia ear rot infection commonly occurs in the two weeks prior to and after silking. The ear rot phase first becomes visible from a distance when husks turn tan prematurely. Black specks (fungal fruiting bodies known as pycnidia) appear on the husk, shank, and kernels. When pulling the husks back, the ear will have a whitish mold forming in the grooves between kernel rows, usually starting at the base of the ear and progressing toward the tip (Figure 1). Over time, the white moldy appearance may turn brown. The ear rot phase results in moldy, low-test weight kernels that frequently result in dockages at grain elevators (Figure 2). Unlike other ear rots, including *Gibberella*, *Aspergillus* and *Fusarium* ear rots, *Diplodia* ear rot does *not* produce mycotoxins.



Figure 1 Symptoms of *Diplodia* ear rot.
Image by B. Grabow.



Figure 2 Symptoms of *Diplodia* ear rot damage to kernels. Image by B. Grabow.

Diplodia stalk rot is first visible from a distance when plants decline around mid to late ear fill. Infected plants will die prematurely. The stalks will feel squishy when using the squeeze test, indicating a lack of structural integrity in the lower portion of the stalk. Upon closer inspection, black specks (pycnidia) will form on the lower portion of the stalk (Figure 3). The pith of the stalk will have a tan to brownish discoloration. The inner stalk will be weak and shredded, with vascular bundles remaining intact, giving the lower stalk a stringy appearance. As the stalk rot disease progresses, lodging can occur resulting in even greater yield loss.



Figure 3 Symptoms of *Diplodia* stalk rot. Image by D. Jardine.

Life Cycle

Corn is the only host for the Diplodia stalk and ear rot fungus. Between growing seasons, the fungus survives in crop residue in the pycnidia (see Symptoms). The pycnidia produce spores that ooze from the fruiting body during times of high moisture. The conidia are splash dispersed from the corn residue to the developing plant, thus ear infection is most common when rain occurs during pollination. Infection can occur through roots and crown tissue. The ear rot phase of the disease becomes active when conditions are dry, followed by warm (80-87°F), wet conditions, approximately two weeks before and after silking. The disease complex is most severe under conditions of continuous cropping, and reduced or no-till practices. Other factors that can favor disease development include: too high or low fertility, high plant populations, and injury from insects, disease, or severe weather.

Management

A one to two year rotation is an effective management option for Diplodia stalk and ear rot. It will drastically decrease the amount of inoculum in the field, thereby reducing the risk of disease. Where viable, increasing tillage will also decrease the amount of disease in the next crop. Reducing other plant stresses by managing insect pests, foliar diseases, balancing fertility, and planting at recommended population rates will reduce the risk of Diplodia, and other stalk rot diseases as well. Choosing a hybrid with good stalk strength will reduce lodging associated with the stalk rot stage of the disease. Planting hybrids with varying maturity will reduce the risk of all the plants being susceptible at the same time if weather conditions are favorable for infection around silking. Fungicides are not effective at controlling the Diplodia diseases.