



Diplodia Ear Rot of Corn

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IMPORTANCE

Diplodia ear rot can reduce yield and grain quality by damaging kernels, lowering grain test weight, and reducing grain fill. Incidence of affected ears in the field can vary from 1% or 2% to as high as 80%. Although mycotoxins have been associated with Diplodia ear rot in South America and South Africa, there have been no reports of livestock feeding issues due to mycotoxins linked to Diplodia ear rot in the United States.

SYMPTOMS & SIGNS

Symptoms and signs of Diplodia ear rot generally appear at early dough (R4), although they may not be noticed until harvest. The most common sign associated with Diplodia ear rot is a white/gray mold on ears, generally starting at the base of ears and progressing toward tips (FIGURE 1). In addition, black fungal structures, known as pycnidia, may be observed on affected kernels (FIGURE 2). Other common symptoms and signs include:

- Mummification of ears .
- Ears may appear shrunken and greyish brown in color.
- Infected kernels appear “glued” to the cob.
- Leaf sheath and ear leaves die (FIGURE 3).
- Infected kernels turn gray to brown.



FIGURE 1. DIPLODIA EAR ROT IS CHARACTERIZED BY A WHITE MOLD ON EARS.



FIGURE 2



FIGURE 3



FIGURE 4

FIGURE 2. BLACK FUNGAL STRUCTURES (PYCNIDIA) CAN BE OBSERVED IN *STENOCARPELLA*-INFECTED EARS.

FIGURE 3. EARLY SYMPTOMS OF DIPLODIA EAR ROT INCLUDE BLEACHED HUSKS AND EAR LEAF DIEBACK.

FIGURE 4. OCCASIONALLY, DIPLODIA EAR ROT CAN CAUSE A LIGHTWEIGHT EAR WITH DISCOLORED KERNELS, BUT WITHOUT VISIBLE WHITEMOLD.

- Infected ears may be completely rotted and lightweight.
- Occasionally premature germination of the kernel occurs.

Occasionally, ears affected by Diplodia ear rot may lack symptoms, or kernels may be brown and discolored without the white fungal mat on the ear (Figure 4). Ears with this symptom will be lightweight and affected cobs may be rotten.

CAUSE & DISEASE DEVELOPMENT

Diplodia ear rot is caused primarily by the fungi *Stenocarpella maydis*, and to a lesser extent, *Stenocarpella macrospora*. The fungus *S. macrospora* is also the causal organism of the foliar disease Diplodia leaf streak. In South America and South Africa, *S. macrospora* has been recognized as a major ear rot pathogen, but the incidence of Diplodia ear rot caused by *S. macrospora* is currently unknown in Kentucky. However, Diplodia leaf streak is commonly observed in Kentucky, and recent cases of ear rot caused by *S. macrospora* have been documented in

southern Illinois and western Tennessee. Therefore, ear rot caused by *S. macrospora* could occur more frequently than has been reported.

Corn is the only host for these fungi, which can overwinter on corn residue, including leaves, stalks, cobs and kernels. Wet weather in spring causes these fungi to produce spores that splash up to developing ears during silking (R1 growth stage). These spores infect through ear shanks during silking, penetrating into cobs and outward through kernels.

Ears are most susceptible to infection around growth stage R1 and will be less susceptible as ears mature. Wet weather at and after R1 favor infection. If infection occurs, the *Diplodia* ear rot fungi continue to colonize ears after black layer (physiological maturity) and as long as ears are above 15% moisture. The disease can be particularly severe in years with wet weather at silking and when wet weather delays harvest, allowing the fungus to continue to colonize ears.

Diplodia ear rot levels usually are highest in fields with conservation tillage and/or continuous corn.

DISEASE MANAGEMENT

Diplodia ear rot requires multiple management strategies, which are outlined below.

Resistance

- There are hybrids available that are less susceptible to *Diplodia* ear rot, although complete resistance is not available. Some, but not all, seed companies provide *Diplodia* ear rot resistance ratings for their hybrids.

Cultural Practices

- Crop rotation is important to reduce *Diplodia* ear rot levels in fields with a history of the disease.
- At least a 2-year rotation away from corn is preferred, since *S. maydis* can survive in residue at the soil surface for more than one growing season.
- Fungicides are not consistently effective at reducing *Diplodia* ear rot.

Harvest & Postharvest Practices

- Fields with *Diplodia* ear rot should be prioritized for harvest to minimize the impact on grain quality.
- Grain should be dried to or below 15.5% moisture.
- Grain that is to be stored long-term should be dried to 13% moisture. Affected grain should be stored separately from healthy grain and monitored to make sure grain moisture does not exceed 15%. To date, no mycotoxin-related issues have been reported from feeding *Stenocarpella*-infected grain to livestock in the United States.

ADDITIONAL RESOURCES

- Plant Pathology Extension Publications
<http://plantpathology.ca.uky.edu/extension/publications>
- A Comprehensive Guide to Corn Management in Kentucky (University of Kentucky, ID-139)
<http://www2.ca.uky.edu/agcomm/pubs/id/id139/id139.htm>
- Kentucky Integrated Crop Management Manual for Corn (University of Kentucky, IPM-2)
<https://ipm.ca.uky.edu/files/ipm2corn.pdf>
- Corn Disease Management: Ear Rots (Crop Protection Network, CPN-2001)
<http://cropprotectionnetwork.org/corn/ear-rots/>

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