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Diagnosing Lodged Corn

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In a lot of areas across the Corn Belt we have experienced some significant stress this year. The more stress the corn plant experiences throughout the year, the greater the chances of seeing lodged corn late in the season. When lodging happens, it is important to head out to the field and diagnose why the corn lodged. By having this information, you can make better management decisions for next year. The remainder of this bulletin will look at some factors that contribute to lodged corn. These are some common factors, but this by no means is an exhaustive list.

Root Lodging

When corn experiences root lodging, I often find one of two main culprits. The first one is rootworm damage. I went on several service calls this summer and it was very clear that rootworms were the issue. It is best to dig roots and look for rootworms during the summer. The feeding by the rootworms is fresh and the regeneration of roots is easily seen. It is still possible now to determine if the root lodging is caused by rootworm feeding by evaluating roots. You will be able to pull the plants directly out of the ground, or there will be very little root mass underneath the corn plant.

The second culprit I often find that leads to root lodging is poor root development. This could simply be a hybrid issue as different hybrids will exhibit different rooting patterns. However, soil conditions and planter settings at planting can greatly affect root structure. Sidewall compaction can result from planting in soils that are too wet or simply by having too much down pressure. Either way, the resulting conditions will lead to poor root development and will impact standability. The pictures below show what can happen due to sidewall compaction. Rain covers a lot of mistakes throughout the year. Years that are wet early and dry late can exacerbate this problem. You can see the “tomahawk” pattern of the roots as well as the resulting ear on the plant.



Picture courtesy of Ryan Dunsbergen, LG Seeds



Picture courtesy of Ryan Dunsbergen, LG Seeds

Stalk Lodging

When corn experiences late season stalk lodging, the main culprits are often European corn borers or stalk rots. There are usually two generations of European Corn Borer in the Midwest Corn Belt. When the first-generation moths are looking to lay eggs, they are looking for tall, green early planted corn. When the second-generation moths are looking to lay eggs, they are attracted to actively pollinating corn. Therefore, later maturing and/or replanted conventional corn are the most susceptible to second generation corn borers. Both generations will tunnel directly into the stalk, leading to lodging. The second generation will also tunnel into the ear shank, leading to ear droppage. Tunneling into the stalk also allows another entry point for pathogens to enter and can lead to a greater incidence of stalk rot.

Common Stalk Rots (Pictures courtesy of Iowa State University)

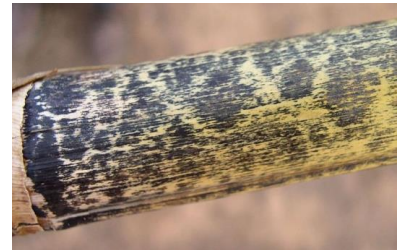
Physoderma Stalk Rot (node breakage)

- Lower nodes are rotted and brittle.
- Green, healthy looking corn simply snaps off at the node.
- Infects the plant from V5 – V9. Needs standing water to produce swimming spores.
- Optimum temperature is 73-86° F.
- Opens the door to other aggressive stalk rots.



Anthracnose Stalk Rot

- Shiny, black coloration on stalk.
- Favored by warm, moist weather (70-85 °F).
- Disease severity is increased by low light intensity and high humidity.
- Can lead to top die-back.
- Can result from excessive nitrogen applications.



Fusarium Stalk Rot

- Caused by several Fusarium species. Can also cause ear rot.
- Infection commonly leads to rotting of roots, crown, and lower internodes.
- Inner stalk will have a light pink discoloration, but no black specks will be present.
- Perpetuated by early warm, dry weather followed by warm, wet weather.



Diplodia Stalk Rot

- Diplodia maydis can cause both stalk and ear rot.
- Tiny dark brown/black reproductive structures called pycnidia are embedded in husk, pith or rind.
- White mycelium can develop in lower stalks.
- Perpetuated by early dry weather followed by warm, wet weather during grain fill.



Gibberella Stalk Rot

- Over-winters in crop residue and soil. It can also cause ear rot.
- Small, dark fungal bodies similar to diplodia but are easily scraped off.
- Pink to red discoloration.
- Perpetuated by warm, wet weather during grain fill.



Sources and Additional Information:

1. <https://www.extension.iastate.edu/grain/files/Migrated/IPM50.pdf>
2. <http://extensionpublications.unl.edu/assets/pdf/ec1898.pdf>
3. <http://crops.extension.iastate.edu/cropnews/2015/07/physoderma-brown-spot-and-stalk-rot>

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