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Potential disease problems in corn following corn

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Abstract
Corn is vulnerable to the following infections by plant pathogens throughout the growing season under favorable environmental conditions: seed rots and seedling blights soon after planting, foliar diseases in mid-season, and stalk and ear rots toward the end of the growing season. Many of these diseases are caused by pathogens that survive in crop residue or in the soil. Thus, the risk of increased disease severity is higher when corn follows corn. However, do not forget the disease triangle (below). Weather conditions during the growing season will still significantly impact disease severity.

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Plant Diseases

Potential disease problems in corn following corn

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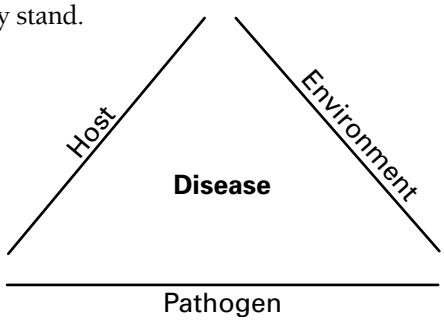
Corn is vulnerable to the following infections by plant pathogens throughout the growing season under favorable environmental conditions: seed rots and seedling blights soon after planting, foliar diseases in mid-season, and stalk and ear rots toward the end of the growing season. Many of these diseases are caused by pathogens that survive in crop residue or in the soil. Thus, the risk of increased disease severity is higher when corn follows corn. However, do not forget the disease triangle (below). Weather conditions during the growing season will still significantly impact disease severity.

Anticipated disease problems that might occur in corn-on-corn fields in Iowa include the following.

Seed rots and seedling blights

Numerous fungal species in several genera (*Fusarium* spp., *Rhizoctonia* spp., *Pythium* spp., *Diplodia* spp., *Penicillium* spp., *Trichoderma* spp.) cause seed rots and seedling blights in corn. All these fungi are common microbial inhabitants of corn fields. They survive in crop residue and the soil. Cool (<55 °F), wet soils favor the development of seedling diseases. Seedling susceptibility to infection increases the longer the seed sits in the ground, and the more stress germinating corn undergoes. Corn germinates and emerges quickly at soil temperatures above 68 °F. When soil temperatures are below 55 °F, germination and emergence are greatly retarded. Although several of the seedling pathogens can attack both corn and soybean, there are others that are specific to corn and their populations will increase under continuous corn. Thus, corn-on-corn fields, in particular those with crop residues left on the surface, will be more prone to seedling diseases due to higher inoculum pressure and cooler, wetter soils. Seed treatments will continue to be necessary to ensure a healthy stand.



Foliar diseases

The most common foliar diseases of corn in Iowa include anthracnose leaf blight, gray leaf spot, northern leaf blight, common and southern rust, and eyespot. Apart from the rusts, which are windblown from the South each growing season, the fungi that cause these diseases survive in infested corn residues left on the soil surface. Research has shown that disease severity is directly associated with the amount of surface residue. This means that in corn-on-corn fields, inoculum pressure will be considerably greater, especially in those fields where foliar diseases were a problem the previous season. Under moist conditions, the fungi produce spores that are either rainsplashed or blown by the wind onto susceptible corn leaves and infection occurs. Lesions develop and produce more spores that

Gray leaf spot disease severity is directly associated with the amount of surface residue. ***(Gary Munkvold)***

are spread to and infect the upper leaves. Therefore, as the season progresses, and provided environmental conditions are conducive to disease development (moderate temperatures and high moisture), the disease moves up the plant from the lower canopy to the upper canopy. Scouting for foliar diseases will be critical in corn-on-corn fields to ensure that fungicide applications are applied in a timely manner, and the ear leaf and leaves above the ear are protected from infection and extensive blight development during grain fill. Additionally, leaf diseases are often accompanied by stalk rot; therefore, it also will be important to monitor stalk quality and opt for a timely harvest if leaf diseases occur.

Stalk rots

Anthracnose stalk rot symptoms.

Common stalk rots in Iowa include anthracnose stalk rot, Fusarium stalk rot, Gibberella stalk rot, Diplodia stalk rot, and charcoal rot. These fungi survive in crop residue or in the soil. They have several pathways to stalk infection, including the root systems. Any stressful conditions that reduce photosynthesis and the production of carbohydrates during grain fill predispose corn plants to stalk rots. Stressful conditions include drought, foliar disease, hail damage, inadequate nutrition or compaction, and insect damage. Most of these pathogens are specific to corn and their populations in the residue and soil will build up under continuous corn. Although the effects of tillage on stalk rots are complex, the presence of corn residue in the field increases the risk of some of the stalk rots; additionally, the likelihood of an extended harvest because of increased corn acreage increases the risk of stalk rot developing. Therefore, checking stalk quality in the field will be increasingly important in corn-following-corn fields so that a timely harvest can be scheduled if necessary.

Ear rots

Common ear rots in Iowa include Fusarium ear rot, Gibberella ear rot, and Diplodia ear rot when normal to above normal rainfall seasons occur from silking to harvest and Aspergillus ear rot when hot, dry conditions occur over the same period. As mentioned before, these fungi survive in crop residue on the soil surface and also in the soil, and their populations will be higher in corn-on-corn fields. Thus, there is an increased risk of some of these diseases in corn-following-corn fields. Once again, it will be important to get into each field and scout for ear rot problems. If disease is a problem on more than 10 percent of the ears, timely harvest, quick dry down to 15 percent moisture or less, and cooling the temperature of the grain will be crucial to maintain quality.

Fusarium ear rot.

Gibberella ear rot.

Diplodia ear rot.

Aspergillus ear rot.

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