Corn Gray Leaf Spot

Gray leaf spot is typically the most serious foliar disease of corn in the U.S. corn belt, although other diseases can be more important in areas and years where weather conditions do not favor gray leaf spot. Gray leaf spot requires extended periods of high humidity and warm conditions.

Scientific name: Cercospora zeae-maydis

Pathogen Facts

Gray leaf spot (GLS) is a common fungal disease in the United States caused by the pathogen Cercospora zeae-maydis in corn. Disease development is favored by warm temperatures, 80°F or 27 °C; and high humidity, relative humidity of 90% or higher for 12 hours or more. Cercospora zeae-maydis overwinters in corn residue, allowing inoculum to build up from year to year in fields. Cropping systems with reduced- or no-till and/or continuous corn are at higher risk for gray leaf spot outbreaks. Conducive weather conditions encourage the rapid spread of disease near the end of summer and early fall, when corn plants allocate more resources to grainfill.

Identification

Early Symptoms

Gray leaf spot lesions begin as small necrotic pinpoints with chlorotic halos, these are more visible when leaves are backlit.

Coloration of initial lesions can range from tan to brown before sporulation begins.

Because early lesions are ambiguous, they are easily confused with other foliar diseases such as anthracnose leaf blight, eyespot, or common rust.

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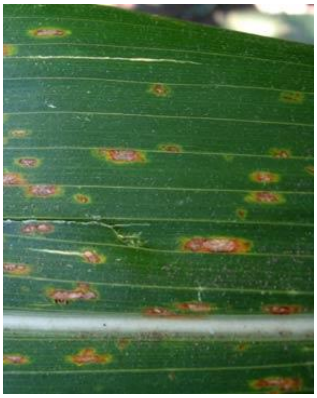


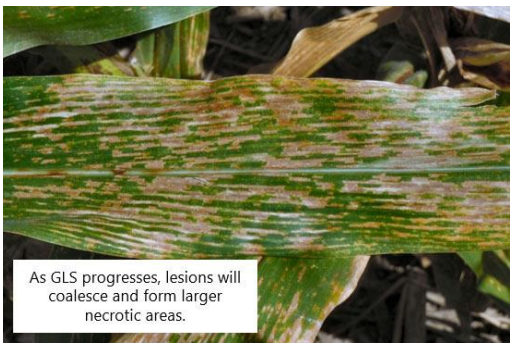
Later Symptoms

As infection progresses, lesions begin to take on a more distinct shape.

Lesion expansion is limited by parallel leaf veins, resulting in the blocky shaped “spots”.

As sporulation commences, the lesions take on a more gray coloration.

Entire leaves can be killed when weather conditions are favorable, and rapid disease progression causes lesions to merge.



Crop Damage

Gray leaf spot lesions on corn leaves hinder photosynthetic activity, reducing carbohydrates allocated towards grain fill. The extent to which gray leaf spot damages crop yields can be estimated based on the extent to which leaves are infected relative to grainfill (Table 1). Damage can be more severe when developing lesions progress past the ear leaf around pollination time. Because a decrease in functioning leaf area limits photosynthates dedicated towards grainfill, the plant might mobilize more carbohydrates from the stalk to fill kernels. This can result in a higher risk of stalk lodging and stalk rots due to a loss of structural integrity.

Management Considerations

Cultural Practices

Cercospora zeae-maydis overwinters in corn debris, so production practices such as tillage and crop rotation that reduce the amount corn residue on the surface will decrease the amount of primary inoculum.

Crop rotation away from corn can reduce disease pressure, but multiple years may be necessary in no-till scenarios.

Hybrid Resistance

Planting hybrids with a high level of genetic resistance can help reduce the risk of yield loss due to gray leaf spot infection. Pioneer® brand hybrids and parent lines are improved through a screening process in areas with a high incidence of GLS and specialized "disease nurseries". Customers can see the effectiveness of hybrid resistance based off of a score (ranging from 1 to 9) that is assigned to Pioneer brand products. Susceptible hybrids are more likely to benefit from a foliar fungicide application, but resistant varieties may benefit as well under high gray leaf spot pressure (Figure 2).

Fungicides

During the growing season, foliar fungicides can be used to manage gray leaf spot outbreaks. Farmers must consider the cost of the application and market value of their corn before determining if fungicides will be an economical solution to GLS. When selecting a fungicide, it is important to keep in mind the efficacy of the available products.