

Gray Leaf Spot Management

Gray leaf spot is favored by high relative humidity and prolonged leaf wetness, but can be managed with corn product selection, fungicides, residue management, and crop rotation.

What to Consider

Gray leaf spot is a fungal pathogen overwintering in corn residue left on the surface of the soil. In the spring, adequate moisture and humidity promotes dissemination of fungal infection structures, and wind or rain splashes them onto newly planted corn. Lower leaves of plants are usually infected first with mature lesions developing after several weeks. Secondary inoculum are produced from mature lesions to continue the cycle of infection. Infected corn residue left in fields provides the inoculum for the following season. Infection cycles may vary from two to four weeks depending on environment and the susceptibility of corn products.¹

Environmental conditions favoring development gray leaf spot include:

- Prolonged periods high relative humidity (90% or greater),
- Warm temperatures (70 to 90°F)², and
- Long lasting fogs or heavy dews
- Fungal structures may stay dormant until conditions become favorable.¹

Symptoms may initially appear two to four weeks after infection and include:

- Immature lesions appear as small, brown, or tan spots on leaf surfaces.
- Lesions are surrounded by a yellow halo and may resemble eyespot, anthracnose, or common rust.²
- Maturing lesions elongate and develop rectangular, brown to gray necrotic regions running parallel to leaves. The rectangular shape of mature lesions help distinguish GLS from other diseases.
- Lesions span between the major leaf veins, but can coalesce and blight large portions of leaves in severe infestations.
- Tufts of fuzzy, gray fungal spores produced on the underside of leaves beneath mature lesions.
- Mature lesions may look black at harvest.

Impact on Yield

Yield potential may be negatively affected with the loss of photosynthetic area when leaves or entire plants become blighted. Severity of yield loss depends on location of the infected leaves and growth stage of the



Figure 1. GLS rectangular lesions.



Figure 2. Severe GLS leaf infection.

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plant at which infection occurs. Yield potential may be most affected when leaves are blighted above the ears and/or when leaves are infected before or at silking.¹ Lodging can occur because stalk integrity may be lost due to leaf death and the resulting insufficient carbohydrates to fill ears and maintain carbohydrate levels in roots and stalks.

Management Options

Fields at highest risk for potential yield loss from GLS are those 1) with a history of GLS, 2) planted in continuous corn, 3) in no-till or reduced-till cultivation practices.

- Use of tolerant corn products is the most effective strategy to preserve yield potential, especially in fields with high probability of GLS.³ Corn products are available with levels of resistance that help maintain yield potential.
- Timely fungicide applications are effective at minimizing yield losses when susceptible and moderately susceptible products are planted in situations where GLS is likely to occur. A long latent period makes it difficult to develop a standard economic threshold for GLS. Tasseling to early silking (VT to R1) growth stage is the critical time to implement controls to protect yield potential if environmental conditions have been or are likely for infection.
- Tillage can have substantial impact on the occurrence of GLS because pathogens do not survive well when host debris is incorporated into soils.
- Rotating to crops other than corn for one year, followed by tillage, or for two years or more for reduced-tillage fields, can reduce levels of disease inoculum in fields where there has been a recent history of GLS.²

| Active Ingredient(s) (%) | Trade Name | Rate/acre (fl oz/acre) | Efficacy Rating | Harvest Restriction* |
|--|----------------------------------|------------------------|-------------------|----------------------|
| azoxystrobin 22.9% | Quadris® multiple generics | 6.0 to 15.5 | Excellent | 7 days |
| pyraclostrobin 23.6% pyraclostrobin 23.3% | Headline® Headline® SC | 6.0 to 12.0 | Excellent | 7 days |
| picoxystrobin 22.5% | Aproach® | 3.0 to 12.0 | Fair to Very Good | 7 days |
| tetraconazole 20.5% | Domark® 230 ME | 4.0 to 6.0 | Excellent | R3 (milk) |
| azoxystrobin 13.5% propiconazole 11.7% | Quilt Xcel® multiple generics | 10.5 to 14.0 | Excellent | 30 days |
| benzovindiflupyr 2.9% azoxystrobin 10.5% propiconazole 11.9% | Trivapro® | 13.7 | Excellent | 30 days |
| cyproconazole 7.17% picoxystrobin 17.94% | Aproach® Prima | 3.4 to 6.8 | Excellent | 30 days |
| flutriafol 19.3% fluoxastrobin 14.84% | Fortix® Preemptor™ SC | 4.0 to 6.0 | Excellent | R4 (dough) |
| pyraclostrobin 28.58% fluxapyroxad 14.33% | Priaxor® D | 4.0 to 8.0 | Very Good | 21 days |
| pyraclostrobin 13.6% metconazole 5.1% | Headline AMP® | 10.0 to 14.4 | Excellent | 20 days |
| trifloxystrobin 32.3% prothioconazole 10.8% | Stratego® YLD | 4.0 to 5.0 | Excellent | 14 days |

Source: Wise, K. 2018. Fungicide efficacy for control of corn diseases. CPN-2011-W. Crop protection network. <https://cropprotectionnetwork.org/2018/03/21/fungicide-eficacy-for-control-of-corn-diseases/>.
*Harvest restrictions for field corn harvested for grain. Restrictions may vary for other types of corn (sweet, seed, pop-corn) and for corn for other uses (such as forage or fodder).

- Growing corn for silage reduces amounts of inoculum available to infect corn the following season because silage corn is usually harvested before significant blighting and there is a limited amount of corn residue after harvest.⁴

Sources

- 1 Wise, K. 2010. Diseases of corn: gray leaf spot. Purdue University Extension. www.extension.purdue.edu. BP-56-W.
- 2 Rees, J.M. and Jackson, T.A. 2008. Gray leaf spot corn. University of Nebraska-Lincoln Extension. NebGuide G1902.
- 3 Robertson, A.E. 2012. Gray leaf spot. USDA-NIFA Outreach Webcast. www.plantmanagementnetwork.org
- 4 Stromberg, E.L. 2009. Gray leaf spot disease of corn. Virginia Cooperative Extension. www.pubs.ext.vt.edu. Web sources verified 05/14/15

Performance may vary, from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields.

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