

Gray Leaf Spot (Blast) in Annual Ryegrass



Annual ryegrass is an important forage grass in Mississippi because of its high levels of palatability and digestibility for livestock. Every year, more than 700,000 acres of annual ryegrass are planted in prepared seedbeds or overseeded in warm-season grasses.

Ryegrass blast, also called gray leaf spot, has been a very serious disease in ryegrass throughout Mississippi and Louisiana since the 1970s. Although the disease occurs throughout the state, it is primarily confined to the southeastern region because of ideal environmental conditions in early fall for the fungus to proliferate. Blast may occur on early-planted ryegrass pastures and reduce the time producers have for winter grazing, but the ryegrass can be reseeded.

Pathogen, Symptoms, and Signs

Blast is a foliar disease. It is caused by a fungal pathogen (*Pyricularia grisea*) that readily infects and kills leaf blades. Leaf infections can progress into the crown area, resulting in death of individual plants. Blast causes a great range of symptoms, including leaf spots and leaf blight that usually progress to leaf distortion, collapse, and death, especially within swards of juvenile plants (**Figure 1**). Dying leaves tend to develop a characteristic “fish hook” twist at the leaf tip that helps differentiate this disease from brown patch or *Pythium* blight.

Symptom expression is influenced by environmental conditions and the growth stage of the annual ryegrass. *Pyricularia grisea* can infect annual ryegrass from the seedling stage through maturity. In young annual ryegrass,

leaf infections first appear as water-soaked spots and leaf blades that are distorted and twisted at the point of infection. Leaf symptoms may further progress into round or oval lesions with gray centers and dark brown margins. Infected leaves die, and seedling death may occur rapidly.

On more mature plants with wider leaf blades, leaf spots are observed more readily and seem to persist longer because mature plants blight more slowly. In Mississippi, blast symptoms usually start in late August to late September with extended periods of high relative humidity and warm temperatures. The infected areas are sometimes covered with fuzzy, gray spores, giving a felt-like appearance to the blighted leaf blades. Individual leaf spots develop quickly, and the disease spreads from the blades to the crown of the plant. It can kill a stand of ryegrass within 48 hours if disease conditions are favorable. In the field, symptoms first appear as small, diffuse clusters, and sometimes the affected areas have a scorched or drought-stressed appearance.

Epidemiology

The fungus is thought to survive the winter locally in infected leaves and debris. An influx of spores from distant sources may also occur in some years. Factors that eventually trigger epidemics are not completely understood, but high temperatures and extended periods of leaf wetness in combination with intermittent dry periods favor disease development. The optimum conditions for disease development are temperatures of 70 to 95°F and relative humidity above 80 percent.



Figure 1. Gray leaf spot (blast) disease symptoms.

The fungus requires a wet leaf surface in order to infect the plant. In the optimal temperature range, infection can occur with as little as 12 hours of continuous leaf wetness. Chances of infection increase exponentially with up to 24 hours of continuous leaf wetness in susceptible cultivars planted in late August to mid-September. New leaf symptoms appear within a few days of infection.

A large number of spores can be produced from leaf lesions, and vast quantities of spores can be spread by wind, splashing water, and equipment. The disease may follow low-lying or poorly drained areas that produce high humidity and prolonged leaf wetness. Quick symptom development combined with massive spore production results in blast epidemics that progress rapidly and are very destructive. The disease dissipates with cooler weather and usually does not present a risk to forage plantings.

Based on reports, annual ryegrass is more susceptible when plants are 4 to 7 weeks old. This should be used as a recommendation for a later planting that will put those young plants in a much cooler, drier environment (less than 78°F and minimum rainfall). Disease development could be sporadic, with little or no disease development in some years.

Disease Management

Several consecutive infection cycles may occur during a single season. Disease severity varies by year, location, and time of disease development during the growing season. Severe outbreaks usually result in death and decay of extensive areas, ruining the entire stand.

There are no labeled fungicides for use in forage production, and producers have limited control options for managing the disease. This causes significant economic and environmental impacts to the forage/livestock industry.

Since the disease is usually driven by wet and warm environmental conditions, avoiding an early planting might be the best option. Delayed planting of more tolerant cultivars to take advantage of cooler fall temperatures could lower the risk of infection and a possible epidemic. This means planting should be delayed until October in the southern part of Mississippi.

Certain cultural practices may help prevent blast or reduce its severity. Avoid excessive nitrogen fertilization when symptoms of the disease might be present. Annual ryegrass that has 3 to 6 inches of growth can be used for light grazing even if blast is present. This type of

management will help remove older dead leaves and allow some sunlight to penetrate through the canopy.

Because it is difficult to produce optimum blast conditions in controlled settings, research on controlling blast is limited. Environmental and animal health regulations also limit the research examining current fungicides. Therefore, the best option for controlling blast is to reduce the opportunities for the fungus to start.

Gulf is the most susceptible variety to blast. Differences in severity between diploid and tetraploid varieties of annual ryegrass have not been well-documented. Cultivars of annual ryegrass that are resistant to *Pyricularia grisea* are not currently available. Plant breeders throughout the South continue to screen for new varieties with significant improvements in blast resistance. For additional information on blast in ryegrass, contact your local MSU Extension office.

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Publication 2633 (POD-10-18)

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Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director