



Gray Leaf Spot “Blast” Disease in Annual Ryegrass

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Annual ryegrass is an important forage grass in Mississippi because of the high levels of palatability and digestibility for livestock. Every year over 700,000 acres of annual ryegrass are planted in a prepared seed bed or over-seeded in warm-season grasses. Ryegrass “blast”, also called Gray Leaf Spot (GLS), 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 reducing the time that 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 progresses to leaf distortion, collapse, and death, especially within swards of juvenile plants (Fig. 1). Dying leaves tend to develop a characteristic twist (“fish hook”) 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 the leaf blades are distorted and twisted at the point of infection. Leaf symptoms may further progress into round or oval lesions with grey 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 quickly develop and the disease spreads from the blades to the crown of the plant and subsequently killing the stand of ryegrass within 48 hours when disease conditions are favorable. In the field the symptoms first appear as small diffuse clusters and sometimes the affected areas may have a scorched appearance or that of drought stress.



Figure 1. Gray Leaf Spot (“Blast”) Disease Symptoms.

Conditions

The fungus is thought to survive the winter locally in infected leaves and debris. Influx of spores from distant sources may also occur in some years. Factors that eventually trigger epidemics are not completely understood, but high temper-



atures and extended periods of leaf wetness in combination with intermittent dry periods favor disease development. The optimum conditions for disease development are temperatures of 70-95°F and relative humidity above 80%. 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. 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 to infect new leaves. The disease may follow low-lying or poorly drained areas that may produce high humidity and prolonged leaf wetness. The combination of quick symptom development and massive spore production are reasons why blast epidemics progress rapidly and are so destructive. The disease dissipates with cooler weather and usually does not present a risk to forage plantings. Disease development could be sporadic with little or no disease development in some years.

Disease Control

Several consecutive infection cycles may follow during a single season. Disease severity varies by year, location and time of disease development during the growing season. Severe outbreaks usually result in the death and decay of extensive areas and ruin the entire stand. A rigorous fungicide program in management of the disease may be required, but there are no labeled fungicides for use in forage production and producers are limited on control options for the pathogen. This causes significant economic and environmental impacts to the forage/livestock industry. Also, several fungicides have performed inconsistently in efficacy trials due to the pathogen's virulence and the amount of inoculum present. Since the disease is usually driven by wet and warm environmental conditions, avoiding an early planting might be the best option. Additionally, certain cultural practices may help reduce blast 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 and this type of management will help remove older dead leaves and allowing some sunlight to penetrate through the canopy.

Due to the difficulty in producing optimum conditions for blast in controlled settings, research data are lacking with regards to understanding what might control blast. Moreover, due to environmental and animal health regulations, research examining current fungicides may be somewhat limited. Therefore, the best option for controlling blast is to reduce the opportunities for the fungus to start.

Differences in severity between diploid and tetraploid varieties of annual ryegrass have not been very-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 to blast resistance. For additional information on blast related questions in ryegrass, contact your local County Extension office.



Upcoming Events:

August 24-25: Pasture and Forage Short Course. Starkville, MS.
Visit <http://msucares.com/crops/forages/shortcourse/index.html> for registration information and agenda.

November 17: Mississippi Forage and Grassland Conference, Starkville, MS



2010 Mississippi State University Pasture and Forage Short Course



**August 24 and 25, 2010
Bost Conference Center**



Mississippi State University Campus

Program Topics:

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- Legume management
- Hay production and quality
- Grazing Systems
- Animal nutrition
- Fencing demonstrations
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- On hand demonstrations
- Tradeshow and more...

Forages & Pastures



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Visit: <http://msucares.com/crops/forages/shortcourse/index.html>



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