

TURFGRASS MATTERS

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Gray Leaf Spot Blasts Ryegrass Fairways in 1995

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I first diagnosed gray leaf spot at Chartwell CC in early November of 1986. Since that time it has appeared sporadically, with no more than one or two cases being observed in a year. The only gray leaf spot I diagnosed in 1994 was restricted to a small area on one ryegrass fairway at Baltimore CC, on 6 October. In late July 1995, however, a deluge of samples brought to me from area golf courses revealed that we were having an epidemic.

As you know, July 1995 was that hottest on record, and except for a two or three day hiatus, the heat wave persisted throughout August. There was only one major rainfall event during the entire month of August, which occurred on 6 August. These environmental conditions are what triggered the problem, and the disease continued to be active into late August, despite cooler night temperatures. The pathogen, *Pyricularia grisea*, remained virulent during somewhat cooler weather because the drought and high day temperatures greatly restricted the ability of perennial ryegrass to grow actively and defend itself. The epidemic subsided by the third week of September, but the pathogen continued to attack and injure seedlings throughout October. There was a resurgence of destructive levels of gray leaf spot in early to mid-November of 1995.

The gray leaf spot pathogen also causes rice blast, the most destructive disease of rice worldwide. Literally overnight, the fungus produces enormous numbers of spores. It seems to

initially attack through leaf tips: at least the initial symptoms include the discoloration and twisting of leaf tips. The



first really noticeable symptom from a standing position is the appearance of reddish-brown spots, which are 1-2 inches in diameter. These spots can easily be confused with *Pythium* blight or brown patch. The major difference is that there is no foliar mycelium associated with gray leaf spot. In the early morning hours the twisted leaf tips may appear felted and either gray, purple, or yellow. The felted appearance is the result of the production of prodigious numbers of spores and their spike-bearing stalks known as conidiophores. Within hours, leaf tips turn brown and are usually twisted. Below the twisted areas a small number of leaf lesions may or may not be evident. The lesions are circular to oblong, about 1/8 inch or less in diameter, grayish-brown with a dark-brown border. Gray to brown lesions with or without a dark-brown border can also develop along the margins of leaf blades. Leaf lesions are not produced during the initial infection

phase, therefore, twisting of the youngest leaf is the most important early warning symptom to look for when scouting for gray leaf spot. During prolonged hot and humid weather the spots enlarge to 3 to 18 inches in diameter. Large areas of turf may be enveloped and collapse in 3 to 5 days, and at this point, the turf develops symptoms that mimic drought stress. The disease is most severe in heat-sink areas such as south facing hillsides or knolls. Another unusual feature of the disease was that it is more destructive in the rough, particularly the first-cut rough where the

soil has been compacted by cart traffic. Evidently, the higher canopy in the rough provides a more ideal micro-environment for the pathogen. This is also supported by the observation that the disease was generally less severe in low-cut, perennial ryegrass approaches, collars or tees. The reduction of disease

continued on page 10

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Gray Leaf Spot

Continued from page 1

in low cut areas may be due in large part to the routine collection of clippings from these sites. While this disease was believed to be just a foliar blighter, during the summer of 1995, it outright killed perennial ryegrass. It is likely that the extreme heat also contributed to the death of plants. Mr. Steve Potter, CGCS, remarked that the rapid spread and destructiveness of gray leaf spot made Pythium blight seem like a "wimp disease."

Gray leaf spot will be more damaging to fairways whose growth is slowed by plant growth regulating chemicals. Herbicide use also intensifies disease severity. Currently, the only fungicides known to control gray leaf spot are Daconil and Dyrene. High rates of Daconil 2787 F (8 to 10 fluid ounces per 1000 ft²) are recommended, but may only provide 5 to 7 days of control. Dyrene at high use rates also arrested gray leaf spot for about 5 to 7 days.

After the disease is stopped, small amounts of water soluble nitrogen (about 1/9 to 1/10 lb N/1000ft² from urea) should be sprayed on 7 to 10 day intervals. These small amounts of N are needed to stimulate growth of the ryegrass and enhance the recovery process. Although a high canopy may be more conducive to pathogen activity, the height of cut should be increased after there has been significant damage to expand leaf area and the photosynthetic capacity of plants. Spores of the pathogen are disseminated by mowers and it is essential that clipping be removed and not returned to fairways when the disease is active. Once turf shows signs of recovery, it may be helpful to reduce the height of cut, but this should only be done if clipping can be removed. Water should be applied in the morning, and overseeded areas may require additional syringing during the day time. Avoid night irrigation to reduce leaf wetness periods, which could enhance gray leaf spot, Pythium blight, brown patch and other diseases. Once night temperatures have cooled in

September, a balanced (N-P-K) fertilizer should be applied at 1.0 # N/1000ft²), with 25% to 50% of the N being provided by a slow release N-source. Overseed as soon as possible, but maintain the Daconil or Dyrene sprays to protect seedlings throughout September.


In nearly every case, gray leaf spot also was association with at least one other potential pathogen. The most common secondary organism was *Leptosphaerulina trifolii*. *L. trifolii* rapidly invades the weakened tissues, further speeding the demise of the ryegrass. *Pythium aphanidermatum* (i.e., cause of Pythium blight) and *Rhizoctonia zeae* (a potent agent of brown patch) were also commonly found in ryegrass samples I inspected. Hence, in addition to Daconil or Dyrene, a Pythium-targeted fungicide also was recommended, particularly just after seedlings have emerged.

The gray leaf spot epidemic of 1995 was the most destructive disease problem in perennial ryegrass fairways that I have ever seen. I'm often asked what should be expected next year, which quite frankly is impossible to predict. It all depends on weather conditions, and should we have another prolonged (>4 weeks) humid heat wave similar to that experienced in 1995, it's likely to happen again. The recurrence of gray spot epidemic, however, can be likened to the ice-kill of ryegrass fairways during the 1993-1994 winter. Both types of weather conditions were extreme and are not likely to be experienced again for many years.

Managing perennial ryegrass for gray leaf spot:

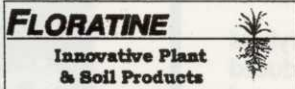
- Monitor sites severely damaged in 1995 on a daily basis beginning in early July.
- Look for twisting of the youngest leaf; do not wait until leaf spot lesions appear.
- Collect clippings and slightly reduce the height of cut on fairways in July and August.
- Irrigate at dawn and avoid the nighttime irrigation.
- Avoid using herbicides and plant growth regulators in July and August.
- Rotate Daconil or Dyrene into the spray program for brown patch in mid-July.

Because of a predicted shortage of perennial ryegrass seed, budget for at least six weekly applications of Daconil or Dyrene. ■




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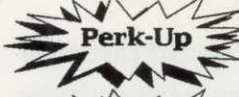
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