

Gray Leaf Spot: What Do We Really Know?

Where Will It Go Next?

In 1991, gray leaf spot on perennial ryegrass was first reported in Pennsylvania. By 1998, it had spread from Vermont and the Carolinas to Kansas and Iowa. The disease reduced stands of perennial ryegrass on golf courses and athletic fields. This was of concern to turf managers because of the extensive damage that can occur within 48 to 72 hours. In 1999, we had a reprieve from the disease because of drier conditions in regions where we usually see it. The few cases that were reported occurred in areas north of where we had previously seen the disease. In Illinois, we saw the disease near Rockford and the Quad Cities where cooler, moist conditions prevailed. Even in inoculated field trials, researchers had trouble creating infection. In the year 2000, disease incidence has been isolated, but sometimes severe. While limited disease has occurred in central Illinois and Pennsylvania, spread of infection has likely been controlled by fungicide application.

Current research and observations have revealed the behavior of this fungus to be quite different from what we previously thought.

It's Not What We Thought

Current research and observations have revealed the behavior of this fungus to be quite different from what we previously thought. In the past, our research showed hot weather associated with continuous leaf wetness and warm nights were required for infection. Now, it appears that hot days with warm evenings may NOT be necessary for infection, and areas with good air circulation may be more susceptible than expected. **Warm, wet** conditions commonly associated with low-pressure systems allow vegetative fungal growth. Then, a high-pressure system brings **dry** air with north winds, inciting production and dispersal of spores. Spore production can be associated with either cool or warm temperatures. **Dew** formation allows spore germination creating extensive **infection**. Fungi thriving on the dew can subsequently be **spread** to other plants by mowing and other traffic. Because of the drying step in the process, open areas with good air circulation may be more susceptible to disease than we used to think. Observations from golf courses indicate further spread by aeration and overseeding is possible. Previous research shows seedlings to be much more susceptible to disease than mature stands.

(continued on page 8)

Table 1.
**Top 10 List for
 Gray Leaf Spot Control**

10. Use a disease forecasting model to time fungicide applications (this may be available in the next year or two).
9. Catch clippings and deposit away from areas where damage commonly occurs.
8. Seed roughs with Kentucky bluegrass, especially the north side of fairways.
7. If possible, treat immediate roughs with fungicides.
6. More water is better in this case. Use the highest labeled recommendation of water when applying fungicides.
5. Don't over-apply nitrogen.
4. Avoid excessive watering when temperatures are warm; this favors fungal growth.
3. Use a rotation schedule for fungicide applications (do not use the same active ingredient back-to-back).
2. Again, ROTATE FUNGICIDES: we have to make them last.
1. Use resistant varieties (they are not available, yet; we're working on it).

Current Ideas For Control

Control of gray leaf spot continues to be difficult. Preventative means opposed to curative means is still the best way to avoid devastation to a stand of grass. Cultural practices in combination with fungicide applications can decrease the risk of gray leaf spot infection. Currently, fungicides are the most effective means to control this disease. There are several things to consider for ensuring proper application of these products:

- which fungicides to apply;
- when to apply them; and
- how to apply them.

The most effective fungicides should be applied when disease occurrence is most probable. Then, rotate to a product with a different mode of action. This should be followed again by the most effective product in the next rotation. Continue to apply this rotation schedule through aerification and overseeding. Apply these fungicides using the highest labeled recommendation of water to insure complete coverage and penetration into the canopy and plant debris.

Along with fungicides, other measures of control exist that may reduce disease incidence.

Irrigation

Because of the relationship between gray leaf spot and water

availability, strategic timing of irrigation is important. Vegetative growth of the fungus is favored by leaf wetness when temperatures are warm. Early morning watering during cooler temperatures discourages fungal growth and infection. This practice also removes dew, which is a nutritious resource for fungal growth. Syringing should not be excessive to promote fungal growth during the warmest hours of the day.

Roughs

Fungicide-treated fairways may develop disease when untreated roughs produce an overwhelming amount of inoculum. If possible, apply fungicides to immediate roughs seeded with perennial ryegrass. Another option would be to seed roughs with Kentucky bluegrass, especially on the north side of fairways.

From hydroseeding
 to prairie seeding
 to wetlands...

McGinty is covering Metro-Chicago. If your land parcel is 1/2 acre or more, hydroseeding is the practical and economical installation method. We can spray on a customized mixture of grass seed, fertilizer and wood fibre mulch for a quick lush lawn. Perhaps your client prefers the natural look of prairie or wetlands. McGinty's expert installation crews can provide those also. So, if you want planned growth or natural growth, call the professionals.

McGinty
 BROS., INC. est. 1959

847.438.5161

Forecasting

While not currently available, researchers at Pennsylvania State University are working on a forecasting model to predict disease occurrence. Preliminary models have fit well with the timing of gray leaf spot infection. More precise timing of fungicide application will reduce costs by allowing application only when an increased risk of disease is predicted.

Host plant resistance is still the best possible means of control. However, varieties resistant to gray leaf spot are not currently available. Researchers at the University of Illinois and elsewhere are working to find resistance in order to develop new varieties. We have already identified collections that are more resistant and expect to isolate this resistance in the near future.

For more information:

The Chemical Control of Turfgrass Diseases 2000 (by Vincelli & Powell, University of Kentucky), available at <http://www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.htm>.

Uddin, W., Burpee, L. L., Stevenson, K. L. 1999. Influence of temperature, leaf wetness duration, and turfgrass age on development of blast disease (gray leaf spot) of *Festuca arundinacea*. Pages 136-141. Proc. 5th Intl. Conf. Plant Prot. Trop. Symp. Kuala Lumpur.

Randy Kane—Chicago District Golf Association.

Hank Wilkinson, Andy Hamblin, Nicolle Hofmann—University of Illinois.



Table 2.
It is important to know the mode of action when rotating fungicides.

FUNGICIDE	SITES OF ACTION	MODE OF ACTION	RISK OF RESISTANCE
Azoxystrobin	Single	Systemic: disrupts electron transport	Moderately high
Chlorothalonil	Multiple	Contact: inhibits sulfur-containing enzymes	Low
Propiconazole	Single	Systemic: inhibits sterol biosynthesis	High
Thiophanate-methyl	Single	Systemic: inhibits mitosis	High
Trifloxystrobin	Single	Mesostemic: inhibits mitochondrial respiration	Unknown



EVERGREEN Protective Covers

- Quality green covers protect and promote growth
- Patented weave construction allows covers to “breathe”
- Minimizes risk from high temperatures . . . retains necessary warmth for early plant growth
- 85% transparent allowing grass to receive enough sunlight to survive winter cold
- Available in stock and custom sizes



ARTHUR CLESEN INC.

www.aclesen.com



543 Diens Dr.
Wheeling, IL 60090
ph: 847-537-2177
fax: 847-537-2210

8050 W. 186th St.
Tinley Park, IL 60477
ph: 708-444-2177
fax: 708-444-2199

