

Plant Pathology Fact Sheet

Efficacy of Fungicides for Controlling Gray Leaf Spot of Perennial Ryegrass

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Introduction

Gray leaf spot caused by *Pyricularia oryzae* (FIGURES 1 and 2) has emerged in recent years as the most destructive disease of perennial ryegrass throughout much of the range of this turfgrass.

While several new cultivars of perennial ryegrass exhibit improved resistance, many swards of perennial ryegrass are susceptible and can become severely diseased under high disease pressure. Cultural practices can contribute to disease management, but alone they do not provide adequate control under high disease pressure. Consequently, the judicious use of fungicides is critical for successful management of this disease.

Efficacy Ratings

Below are efficacy ratings for various fungicides and fungicidal products for control of gray leaf spot of perennial ryegrass, caused by *Pyricularia oryzae*. These



FIGURE 1. DAMAGE CAUSED BY GRAY LEAF SPOT ON A PERENNIAL RYEGRASS FAIRWAY IN LEXINGTON, KENTUCKY

efficacy ratings are based on all published reports available to the author from tests conducted nationwide. These ratings are, of course, subject to change as new data become available. Additional information on fungicides and reducing the risk of fungicide resistance is provided, as well.

TABLE 1. SOME FUNGICIDAL MATERIALS FOR CONTROL OF GRAY LEAF SPOT OF PERENNIAL RYEGRASS

Fungicide	Mobility within Plant	Fungicide Group	Risk of Resistance	Examples of Product Names
Azoxystrobin	Systemic	Qol	High	Heritage 50WG
Chlorothalonil	Protectant	Multisite Inhibitor ¹	NS ²	Daconil Ultrex
Fluoxastrobin	Systemic	Qol	High	Disarm 480SC
Mancozeb ³	Protectant	Multisite Inhibitor ¹	NS ²	Fore Rainshield
Metconazole	Systemic	Triazole	Moderate	Tourney
Propiconazole	Systemic	DMI ⁴	Moderate	Banner MAXX
Pyraclostrobin	Mesostemic ⁵	Qol	High	Insignia 20WG
Thiophanate Methyl	Systemic	Benzimidazole	High	Cleary's 3336; Fungo 50WSB
Triadimefon	Systemic	DMI	Moderate	Bayleton 50
Trifloxystrobin	Mesostemic ⁵	Qol	High	Compass 50WG

¹Multisite inhibitors have no significant risk of resistance.

²NS = not significant

³Products which are premixes of two active ingredients, such as MANhandle and Spectro 90, are not listed in this table.

⁴Demethylation-inhibitor, a sterol-inhibitor fungicide.

⁵Enters into plant tissue but does not translocate in vascular tissue

TABLE 2. EFFICACY RATINGS FOR FUNGICIDES AGAINST GRAY LEAF SPOT

Efficacy Category	Product*	Rate	Application Interval (days)
Excellent under <i>high</i> disease pressure	Cleary's 3336 50WP	4 oz**	14
	Fungo 50WSB	6 oz	14
	Heritage 50WG	0.4 oz	21
	Insignia 20WG	0.5 oz	14
Good under <i>high</i> disease pressure	Banner MAXX + Daconil Ultrex	1.0 fl oz 3.2 oz	14
	Bayleton 50WP + Daconil Ultrex	1.0 oz 3.2 oz	14
	Compass 50WG	0.2 oz	14
	Fore Rainshield NT 80WP + Daconil Ultrex	8.0 oz 3.2 oz	14
	Heritage 50WG + Daconil Ultrex	0.2 oz 3.2 oz	14
	MANhandle 62.25WP	10 oz	14
	Spectro 90 WDG	5.76 oz	14
Good under <i>light to moderate</i> disease pressure	Banner MAXX	2 fl oz	14
	Bayleton 50	1.0 oz	14
	Daconil Ultrex	3.2 oz	7 to 10
	Fore Rainshield NT	8 oz	14

*Published reports on the efficacy of Disarm 480SC, containing fluoxastrobin, have been insufficient to assign an efficacy rating. However, Qol fungicides like fluoxastrobin typically are effective against gray leaf spot. In addition, there has been limited published data on the efficacy of metconazole.

**Maximum allowable application rates of thiophanate methyl on fairways recently were reduced by the US EPA. Most of the data on efficacy of thiophanate methyl against gray leaf spot has been obtained at higher application rates than are currently labeled. However, limited studies available to date suggest that the 4.0 rate of Cleary's 3336 (or an equivalent rate of a similar product), which is labeled for golf course fairways, performs as well as higher rates. The 2 oz rate, labeled for residential and public areas, is probably inadequate for complete control.

Practices for Minimizing the Risk of Fungicide Resistance

Use of the following practices will reduce—but not eliminate—the risk of resistance to QoI fungicides in *Pyricularia oryzae*.

- **Minimize disease pressure through cultural practices** to the extent possible. This will reduce the chance of a resistant mutant by reducing the size of the pathogen population. If fertilizing during the period from June through August, foliar feed with no more than 0.1 to 0.25 pounds soluble nitrogen per 1000 square feet during that period. Schedule irrigations near sunrise and avoid evening irrigation.
- **Minimize consecutive applications of fungicides having a similar mode of action, especially during the period of highest disease pressure.** In fact, since 1998 I have been recommending switching to a different mode of action *each time you spray for gray leaf spot*. This will not prevent the development of resistance; however, it does reduce the risk of resistance, and that is all a turf manager can do.
- **Tank-mix products having different modes of action during periods of high disease pressure.** Chlorothalonil and mancozeb (multi-site inhibitors) are especially good mixing partners from the standpoint of resistance management. There is essentially no risk of resistance to a multi-site inhibitor fungicide. A multi-site inhibitor should be tank-mixed with any systemic fungicide that is used curatively against gray leaf spot. This



FIGURE 2. LEAF SPOTTING AND LEAF BLIGHT SYMPTOMS CAUSED BY GRAY LEAF SPOT

is because, in a curative situation, you are treating a large population of spores in the turf; the larger the population, the greater the chance that a fungicide-resistant mutant is present. Including the multi-site inhibitor gives you some chance at killing out that mutant before it builds up.

- **Switch from the QoI fungicides and thiophanate methyl to other products during periods of low disease pressure,** such as at the tail end of the period of gray leaf spot activity. This reduces

the exposure of *P. oryzae* to these at-risk fungicides.

Additional Resource

Disease management advice can be found in the following University of Kentucky publication available at County Extension offices, as well as on the Internet.

- Chemical Control of Turfgrass Diseases (2009)
<http://www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf>

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Photos by Paul Vincelli, University of Kentucky