

Title: Evaluation of fungicides for control of gray leaf spot of perennial ryegrass
Authors: R. Latin, J. Stewart, and D. McDuffee

Objective: The objective of this research was to assess the performance of various compounds for their effectiveness against gray leaf spot on perennial ryegrass.

Rationale: Gray leaf spot occurs sporadically throughout the lower Midwest. However, when outbreaks are severe, significant amounts of turf can be killed affecting appearance and playability of golf fairways and athletic turf with significant amounts of perennial ryegrass. Once a real threat of gray leaf spot exists, fungicides are used to protect against disease-related damage. Fungicide trials provide a basis for comparison of the efficacy of selected products. Presenting results of such trials offers turf managers an opportunity to review product performance over the duration of the trial.

How it was done: This research was conducted at the Purdue University Daniel Turfgrass Research and Diagnostic Center in West Lafayette, IN. Plots were located on a sward (identified as block 20) of a blend of perennial ryegrass cultivars maintained at a height of 0.5 in. Fertilization and irrigation operations were done according to standard practices for perennial ryegrass at fairway height. During summer 2005, fertilizer (18-4-10) was applied at a rate of approximately 1.0 lb N per 1000 sq ft on 13 September. The site was treated with Subdue MAXX (1.0 fl oz per 1000 sq ft) on 8 August to protect against Pythium blight, and ProStar 70W (2.2 oz/100 sq ft) to protect against brown patch.

Individual treatment plots measured 3.3 ft by 6.6 ft (1m x 2m) and were randomized within each of the 4 replications. Fungicide applications were made using a custom-built boom sprayer. Three nozzles (Tee-Jet 8004 EVS, flat fan) were mounted approximately 12 in. apart on the boom located 12 in. from the ground. The sprayer was calibrated to deliver 2 gal per 1000 sq ft at 40 psi. All treatments were initiated on 20 July. Treatments applied at 14 day intervals were sprayed on Jul 20, Aug 3, Aug 17, Aug 31, and Sept 14. Treatments applied at 21 day intervals were sprayed on Jul 20, Aug 10, Aug 31, and Sept 20. Treatments applied at 28 day intervals were sprayed on Jul 20, Aug 17, and Sept 14.

Results to date: Visual evaluations of disease severity were recorded at approximately 7 day intervals. Data were subjected to analysis of variance and mean separation procedures. Disease severity (percentage of plot with disease symptoms) results are presented in Table 20.1. Turf quality was assessed 5 times using a 0-9 scale where a score of 9 represented excellent turf quality. Any score below 6.0 indicated unacceptable levels of turf quality. Turf quality evaluations are presented in Tables 20.2.

The prevailing weather during July, August and September was generally favorable for the development of gray leaf spot. Based on observations with the lower Midwest, it appears that inoculum was introduced with the remnants of hurricane Dennis in mid-July. In order to achieve a reasonably uniform inoculation, symptomatic leaves from infected perennial ryegrass fairways were distributed over the entire experimental site on August 15. Gray leaf spot symptoms increased slowly through late-August, then rapidly during September. Based on the differences among treatments, and the progress of disease through the untreated plots, this proved to be an excellent test of fungicide efficacy against gray leaf spot. Turf quality evaluations were related to disease severity in treatment plots. There was no phytotoxicity observed in any of the plots.

Table 20.2. Turf quality evaluations for perennial ryegrass plots treated with fungicides for gray leaf spot control.

Treatment	spray	Turf Quality*									
	interval	5-Sep		12-Sep		19-Sep		26-Sep		2-Oct	
No fungicide		5.50	e	3.50	g	2.00	h	1.50	g	1.00	f
Insignia, 0.9 oz	28	7.25	abcd	7.00	bc	7.00	cd	7.00	bc	8.00	a
Headway 1.39EC, 1.5 fl oz	14	7.50	abc	8.00	a	8.00	ab	8.00	a	7.75	ab
Headway 1.39EC, 3.0 fl oz	28	7.75	ab	7.75	ab	7.75	abc	7.75	ab	8.00	a
Heritage TL (1 fl oz) + Banner Mx (1 fl oz)	14	7.50	abc	8.00	a	7.75	abc	8.00	a	7.75	ab
Heritage TL (2 fl oz) + Banner Mx (2 fl oz)	28	7.25	abcd	8.00	a	8.25	a	7.50	abc	7.75	ab
Heritage TL 0.8 ME, 1 fl oz	14	8.00	a	8.00	a	7.50	abc	7.75	ab	7.50	ab
Heritage TL 0.8 ME, 2 fl oz	28	7.25	abcd	7.00	bc	7.25	bcd	7.50	abc	7.50	ab
Heritage TL 0.8 ME (1 fl oz) alternate	14	7.25	abcd	7.75	ab	7.50	abc	7.75	ab	8.00	a
Ban MX (1 fl oz)+ Dac Ultrex (3.2 oz)											
Instrata 3.61 SE, 2.75 fl oz	14	6.50	d	4.50	f	4.25	g	5.00	f	5.25	de
Instrata 3.61 SE, 4.15 fl oz	21	6.75	cd	6.00	de	5.75	ef	5.50	ef	6.75	bc
Daconil Ultrex 82.5 WG, 3.2 oz	14	7.25	abcd	6.00	de	6.00	ef	6.00	de	6.25	cd
Banner Maxx 1.3ME, 1.0 fl oz	14	6.75	cd	5.50	e	5.50	f	5.00	f	4.50	e
TM 473 480 SC, 1 fl oz	14	7.50	abc	6.50	cd	6.50	de	6.75	cd	6.25	cd
TM 473 480 SC, 2 fl oz	14	7.00	bcd	7.25	abc	7.25	bcd	7.00	bc	6.75	bc
TM 473 480 SC, 3 fl oz	14	7.25	abcd	7.25	abc	7.25	bcd	7.50	abc	7.25	abc
	LSD	0.814		0.795		0.918		0.918		1.000	

Within columns, values followed by the same letter are not significantly different according to Fischer's unprotectd LSD (P=0.05).

*Turf quality was evaluated visually on a 0 - 9 scale, where 9 = excellent turf quality and values below 6.0 represent unacceptable turf quality.