

Evaluation of Fungicides for Control of Dollar Spot on Creeping Bentgrass Fairways, 2004

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Objective:

The objective of this research was to evaluate the performance of registered and experimental fungicides for control of dollar spot on creeping bentgrass maintained at fairway height.

Rationale:

Fungicides are essential tools for managing diseases of fine turf, especially creeping bentgrass. Dollar spot is the most problematic of the creeping bentgrass diseases because outbreaks result in measurable reduction in aesthetic quality and can significantly impair playing surfaces. Moreover, because infection threatens during the entire growing season, dollar spot control is a concern from May through October. Golf course superintendents rely on timely application of fungicides to suppress dollar spot development and they are continually challenged to do so with products and application programs that will be both effective and economical. This research will help superintendents make more informed disease control decisions by providing objective evaluations of fungicides for dollar spot control.

How it was done:

The research was conducted at the Purdue University W.H. Daniel Turfgrass Research and Diagnostic Center in West Lafayette, IN. The experimental site was a stand of L-93 creeping bentgrass located in block 9.3 and maintained at a height of 0.5 in. Fertilization, irrigation and aerification operations were done according to standard practices for creeping bentgrass at fairway height. During spring and summer 2004, fertilizer (18-4-10) was applied at a rate of approximately 1.0 lb N per 1000 sq ft on 21 May, 0.5 lb N per 1000 sq ft on 25 August.

Individual treatment plots measured 3.3 ft by 6.6 ft (1m x 2m) and were randomized within each of the 4 replications. Plots were left to natural inoculation. Fungicide applications were made using a custom-built bicycle wheel boom sprayer. Three nozzles (Tee-Jet 8004 EVS, flat fan) were mounted approximately 12 in. apart on a 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 26 May. Treatments were applied at intervals specified in the tables.

Fungicide performance was evaluated at approximately 7-day intervals. Data were subjected to analysis of variance and mean separation procedures. Results are presented in Table 1. Turf quality evaluations are presented in Table 2.

Results:

The prevailing weather during the course of the experiment was remarkably favorable for dollar spot development, evidenced by severity levels in the unsprayed plots. Where the strobilurin fungicides were applied alone (Heritage formulations, Compass, and Insignia), dollar spot control was unacceptable, although on some rating dates, disease severity was significantly less than the no fungicide treatment. The numbered (experimental) compounds performed very well, with the exception of A14212 3.08 fl oz applied at 28 day intervals. Given the fact that the compound worked well at half the rate and interval and the decline in symptom expression at the end of the season, it is possible that an error was made in the initial application (although we did not record any such errors). The Emerald treatments also performed very well under intense pressure. It is likely that because of the extreme disease-favorable conditions, the Ecoguard treatments did not perform satisfactorily unless used in combination with Daconil.

Table 1 Dollar spot severity^a after applications of fungicide in creeping bentgrass at fairway height

Treatment and rate/1000 sq ft	Spray Interval (days)	%								
		14 Jun	01 Jun	28 Jun	06 Jul	12 Jul	19 Jul	26 Jul	02 Aug	09 Aug
No fungicide		5.4ab ^b	15.8ab	12.9a	47.8a	78.6a	78.6a	84.0 a	88.6a	83.2a
Heritage TL 0.8 ME 1.0 fl oz	14	4.7a-c	2.2c	2.8b	23.9b-d	10.7ef	66.7a-c	22.3gh	40.3d	45.0 d-f
Heritage TL 0.8 ME 2.0 fl oz	28	2.7bc	1.6c	1.6b	6.0d	34.5cd	56.4b-d	22.3gh	45.0 cd	45.0 d-f
Heritage 50WG 0.2 oz	14	3.5a-c	8.2bc	6.3ab	37ab	38.2b-d	54.2b-d	46.5c-e	74.0 ab	65.6bc
Heritage 50WG 0.4 oz	28	5.3a	17.6a	11ab	37.5ab	58.0b	71.3ab	61.0bc	71.3b	58.0 cd
Insignia 20 WG 0.5 oz	14	1.6c	8.2bc	4.1ab	10.7cd	8.0f	45.0d	40.3d-f	61.0 bc	45.0 d-f
Insignia 20 WG 0.9 oz	28	1.6c	4.7c	2.2b	5.4d	29.8de	62.1a-d	40.3d-f	43.1d	39.3 ef
Compass 50WG 0.2 oz	14	1.6c	3.5c	1.6b	4.6d	12.5ef	45.0 d	34.6e-g	61.0 bc	50.7de
A14212 1.54 fl oz	14	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
A14212 3.08 fl oz	28	1.6c	5.4c	6.9ab	21.3b-d	21.3d-f	21.9e	17.3hi	3.5f	2.2g
A13705 1.28 fl oz	14	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
A13705 0.96 fl oz	14	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
Heritage 50WG 0.2 oz + Banner Maxx 1.0 fl oz	14	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
A13817 4.2 fl oz	21	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
A14036 2.75 fl oz	21	1.6c	1.6c	1.6b	2.2d	1.6f	1.6f	1.6i	1.6f	1.6g
A14036 4.15 fl oz	28	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
Daconil Ultrex 3.2 oz	14	1.6c	4.1c	3.3ab	2.8d	1.6f	2.2f	10.1hi	22.3e	31.8f
Emerald 70WG 0.18 oz	21	1.6c	1.6c	1.6b	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g
Emerald 70WG 0.18 oz	28	1.6c	1.6c	2.2b	1.6d	1.6f	3.3f	4.1i	2.2f	2.2g
Ecoguard 20 fl oz	7	1.6c	1.6c	1.6b	7.5d	32.8cd	50.7cd	56.4b-d	35.6de	72.9ab
Ecoguard 20 fl oz	14	2.2bc	3.5c	2.2b	31.4a-c	50.7bc	61.0a-d	71.3ab	88.6a	69.4a-c
Ecoguard 20 fl oz alternate with Daconil Ultrex 82.5 WDG 3.25 oz	14	1.6c	2.2c	1.6b	2.8d	1.6f	2.8f	27.0 f-h	65.6b	56.4cd
Ecoguard 20 fl oz + Daconil Ultrex 82.5 WDG 3.25 oz	14	1.6c	2.8c	1.6b	2.8d	1.6f	2.8f	27.0 f-h	40.3d	39.3ef
Banner Maxx 1.0 fl oz + Daconil Ultrex 82.5 WDG 1.6 oz	28	1.6c	3.5c	12.9a	1.6d	1.6f	1.6f	1.6i	1.6f	1.6g

^a Disease severity was estimated using the Horsfall Barratt rating scale.^b Treatments followed by the same letter within columns are not statistically different according to Fisher's unprotectd LSD, P=0.05

Table 2 Turf quality^a after treatment with fungicide for dollar spot control on creeping bentgrass at fairway height.

Treatment and rate/1000 sq ft	Spray Interval (days)	-----%-----						
		28 Jun	06 Jul	12 Jul	19 Jul	26 Jul	02 Aug	09 Aug
No fungicide		5.8e ^b	4.8h	3.8i	4.3j	3.3j	3.0h	2.5e
Heritage TL 0.8 ME 1.0 fl oz	14	6.5c-e	5.5f-h	6.0d-g	5.0g-i	6.0e-f	5.0d-e	5.0cd
Heritage TL 0.8 ME 2.0 fl oz	28	7.3a-d	5.8e-g	5.3e-h	4.5hi	5.5e-g	5.0de	5.0cd
Heritage 50WG 0.2 oz	14	6.3de	6.0d-g	5.3e-h	5.0gh	5.0gh	4.0fg	4.3d
Heritage 50WG 0.4 oz	28	6.0e	5.5f-h	4.3hi	4.5hi	5.0gh	4.8d-f	4.8cd
Insignia 20 WG 0.5 oz	14	6.5c-e	6.0d-g	6.3c-f	5.5fg	5.3f-h	5.0de	4.8cd
Insignia 20 WG 0.9 oz	28	6.3de	6.5b-e	5.3e-h	4.8g-i	5.0gh	5.3d	5.0cd
Compass 50WG 0.2 oz	14	7.3a-d	5.8e-g	6.0d-g	5.3gh	5.3f-h	4.5d-f	4.8cd
A14212 1.54 fl oz	14	7.5a-c	7.5a	7.8ab	7.5a-c	7.8a	7.5ab	7.3ab
A14212 3.08 fl oz	28	6.3de	7.0a-c	6.5b-e	6.3ef	6.3c-e	6.8bc	7.5ab
A13705 1.28 fl oz	14	7.8ab	7.5a	7.8ab	7.5a-c	7.5ab	7.5ab	7.5ab
A13705 0.96 fl oz	14	8.3a	7.5a	7.3a-d	8.0a	7.8a	6.8bc	7.3ab
Heritage 50WG 0.2 oz + Banner Maxx 1.0 fl oz	14	7.3a-d	7.5a	8.3a	7.8ab	7.8a	7.8a	7.5ab
A13817 4.2 fl oz	21	8.0a	7.5a	7.3a-d	7.8ab	7.0a-c	7.3a-c	7.8a
A14036 2.75 fl oz	21	7.5a-c	6.8a-d	7.5a-c	7.3a-d	7.0a-c	7.0a-c	7.3ab
A14036 4.15 fl oz	28	8.0a	7.5a	7.3a-d	7.0b-e	6.8b-d	7.0a-c	6.8b
Daconil Ultrex 3.2 oz	14	6.5c-e	6.3cf	6.8b-d	6.8c-e	6.3c-e	5.3d	5.3c
Emerald 70WG 0.18 oz	21	7.5a-c	7.5a	7.3a-d	7.8ab	7.0a-c	6.8bc	7.5ab
Emerald 70WG 0.18 oz	28	6.8b-e	7.5a	7.0a-d	6.5de	6.3c-e	6.5c	6.8b
Ecoguard 20 fl oz	7	7.8ab	6.3c-f	5.0f-i	5.5fg	4.5hi	4.3df	2.8e
Ecoguard 20 fl oz	14	6.8b-e	5.3gh	4.8g-i	5.3gh	4.0ij	3.3gh	3.3e
Ecoguard 20 fl oz alternate With Daconil Ultrex 82.5 WDG 3.25 oz	14	7.8ab	6.5b-e	7.8ab	6.8c-e	5.3f-h	4.8d-f	5.3c
Ecoguard 20 fl oz + Daconil Ultrex 82.5 WDG 3.25 oz	14	7.3a-d	6.5b-e	7.8ab	7.0b-e	6.3c-d	5.0de	5.0cd
Banner Maxx 1.0 fl oz + Daconil Ultrex 82.5 WDG 1.6 oz	28	6.3de	7.3ab	7.3a-d	7.8ab	7.5ab	7.3a-c	7.5ab

^a Turf quality was also assessed on a regular basis 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.

^b Treatments followed by the same letter within columns are not statistically different according to Fisher's unprotected LSD, P=0.05