Evaluation of Fungicides for Control of Brown Patch on Colonial Bentgrass, 2004
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Objective:

The objective of this research was to evaluate the performance of registered and experimental fungicides for control of brown patch on bentgrass.

Rationale:

Brown patch outbreaks normally accompany periods of hot wet weather and can contribute to poor turf quality. Golf course superintendents rely on fungicides to suppress brown patch 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 brown patch 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 Bardot colonial bentgrass located in block 4.3 and maintained at a height of 0.5 in. Colonial bentgrass was used because of its susceptibility to the brown patch pathogen, making it a valuable tool for evaluation of treatments for brown patch control. Fertilization, irrigation and aerification operations were done according to standard practices for colonial (creeping) bentgrass at fairway height. During spring and summer 2004, fertilizer (18-4-10) was applied at a rate of approximately 0.1 lb N per 1000 sq ft on 18 April, 0.5 lb N per 1000 sq ft on 13 May, and 0.5 lb N per 1000 sq ft on 24 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 inoculated with a sorghum seed culture of *Rhizoctonia solani* on 24 June. 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 9 June. The date of the final application was 4 August. Treatments were applied at intervals specified in Table 1.

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 generally favorable for brown patch development. The three week period from 4 July through 25 July were marked by ample precipitation, long dew periods and mild evening temperatures. Another brief period of warm wet weather occurred from 1 August through 6 August, resulting in extensive brown patch development in plots that were unprotected. Turf began to recover quickly with the onset of cool dry weather on 7 August.

In general, all of the strobilurin fungicides provided excellent control and maintained high turf quality throughout the season under what I would call moderate disease pressure. The low rate of the Eagle treatment sustained a little more disease that expected, although in some cases, disease levels were not statistically different from the strobilurins. The EcoGuard – Daconil treatments show promise, especially where the high label rate of Daconil was applied. Although not statistically different, the tank mix treatments sustained numerically less disease than the

treatments that included alternating sprays of EcoGuard and Daconil or Chipco 26GT. There was no phytotoxicity observed in any of the plots.

Table 1 Brown patch control[a] on colonial bentgrass at fairway height.

Treatment and rate/1000 sq ft	Spray Interval (days)	21 Jun	28 Jun	06 Jul	13 Jul	19 Jul	26 Jul	02 Aug	09 Aug
		----------%----------							
No fungicide		0.8bc[b]	0.8b	0.8a	3.9ab	2.7ab	27.0a	29.8a	40.3a
Insignia 20WG 0.9 oz	28	0.6c	0.6b	0.6a	0.6b	0.6c	0.8f	1.9e	1.6d
Iprodione Pro 4 fl oz	21	0.6c	0.6b	0.6a	1.9ab	0.8c	7.9b-d	9.2b-d	12.1cd
EcoGuard 20 fl oz	7	2.7a	1.4ab	1.1a	5.4ab	1.6bc	7.7b-e	9.3b-d	25.7b
EcoGuard 20 fl oz	14	1.7a-c	0.8b	0.8a	2.1ab	1.9bc	5.9b-f	14.8bc	15.3bc
EcoGuard 20 fl oz alternate with Daconil Ultrex 82.5 WDG 3.25 oz	14	0.6c	0.8b	0.8a	6.3ab	1.6bc	1.6d-f	3.0de	3.3d
Daconil Ultrex 82.5 WDG 3.25 oz	28	0.6c	0.6b	0.8a	0.6b	0.6c	3.9b-f	5.9de	7.3cd
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 3.25 oz	14	0.6c	0.6b	0.6a	1.3b	0.8c	2.1c-f	2.1e	1.6d
Daconil Ultrex 82.5 WDG 3.25 oz	7	0.6c	0.6b	0.8a	0.8b	0.8c	1.2ef	1.1e	1.3d
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 2.45 oz	14	0.6c	0.6b	0.6a	1.9ab	1.1c	2.1c-f	2.7de	3.3d
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 1.625 oz	14	0.6c	0.6b	0.8a	2.1ab	0.9c	9.2b	3.9de	4.6cd
EcoGuard 20 fl oz alternate with Chipco 26 GT 2SC 4.0 fl oz	14	1.4a-c	0.8b	0.6a	3.0ab	0.9c	2.3c-f	1.6e	2.7d
EcoGuard 20 fl oz + Chipco 26 GT 2SC 4.0 fl oz	14	0.6c	0.6b	0.6a	6.4ab	0.9c	1.2ef	1.9e	4.0d
EcoGuard WP 145 1 oz	7	0.8bc	0.8b	0.8a	7.9a	3.4a	5.9b-f	7.9c-e	10.7cd
EcoGuard WP 140 5 oz	7	2.2ab	1.7ab	0.8a	6.4ab	1.0c	4.6b-f	4.6de	3.3d
EcoGuard WP 145 1 oz	14	0.8bc	0.8b	0.6a	3.8ab	1.1c	5.2b-f	15.4b	15.4bc
EcoGuard WP 140 5 oz	14	0.6c	0.8b	0.6a	6.3ab	1.6b-c	2.6c-f	6.5de	7.3cd
EXP 0357 5 lb	14	0.8bc	0.6b	0.8a	3.0ab	0.9c	2.1c-f	3.8de	2.7d
EXP 0357 10 lb	14	0.8bc	2.7a	0.6a	1.1b	0.8c	1.1f	2.1e	1.6d
Compass 50WDG 0.25 oz	14	0.6c	0.8b	0.6a	0.8b	0.8c	1.9ef	1.6e	2.7d
Eagle 20EW 0.3 oz	14	0.6c	0.6b	0.8a	1.7ab	1.6bc	6.8c-f	7.9c-e	5.6cd
Eagle 40WSP 0.6 oz	14	0.6c	0.6b	0.6a	0.8b	1.1c	8.2bc	3.5de	1.9d

[a] Fungicide performance was evaluated at approximately 7-day intervals using the Horsfall Barratt system for visual assessment of disease severity.
[b] Treatments followed by the same letter within columns are not statistically different according to Fisher's unprotected means separation test, P=0.05.

Table 2 Turf quality[a] after treatment with fungicides for brown patch control on colonial bentgrass at fairway height.

Treatment and rate/1000 sq ft	Spray Interval (days)	21 Jun	28 Jun	06 Jul	13 Jul	19 Jul	26 Jul	02 Aug
		----------%----------						
No fungicide		6.0d[b]	6.3ab	6.0cd	6.5a-c	5.5c	5.0e	5.0d
Insignia 20WG 0.9 oz	28	6.3cd	6.3ab	7.0a	7.0a	7.0a	6.5a	6.3a
Iprodione Pro 4 fl oz	21	6.0d	6.5ab	6.3b-d	6.5a-c	6.0bc	5.5c-e	5.3cd
EcoGuard 20 fl oz	7	6.8ab	6.3ab	5.8d	5.8c	5.5c	5.3de	5.3cd
EcoGuard 20 fl oz	14	6.3cd	6.5ab	6.0cd	6.0bc	6.3a-c	5.5c-e	5.3cd
EcoGuard 20 fl oz alternate with Daconil Ultrex 82.5 WDG 3.25 oz	14	6.0d	6.5ab	5.8d	5.8c	6.0bc	5.8b-d	5.5b-d
Daconil Ultrex 82.5 WDG 3.25 oz	28	6.0d	6.3ab	7.0a	6.3a-c	5.8bc	6.0a-c	6.0ab
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 3.25 oz	14	7.0a	6.8a	6.5a-c	6.5a-c	6.0bc	6.0a-c	6.3a
Daconil Ultrex 82.5 WDG 3.25 oz	7	6.3cd	6.8a	6.8ab	6.8ab	6.3a-c	6.5a	6.3a
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 2.45 oz	14	6.8ab	6.3ab	6.3b-d	6.0bc	5.5c	5.5c-e	5.8a-c
EcoGuard 20 fl oz + Daconil Ultrex 82.5 WDG 1.625 oz	14	6.8ab	6.3ab	6.0cd	5.8c	5.5c	5.8b-d	6.0ab
EcoGuard 20 fl oz alternate with Chipco 26 GT 2SC 4.0 fl oz [c]	14	6.0d	6.8a	6.3b-d	6.3a-c	5.8bc	5.8b-d	5.5b-d
EcoGuard 20 fl oz + Chipco 26 GT 2SC 4.0 fl oz [c]	14	7.0a	6.8a	6.5a-c	6.3a-c	6.0bc	5.8b-d	5.3cd
EcoGuard WP 145 1 oz [c]	7	6.0d	6.5ab	6.3b-d	6.0bc	6.0bc	5.8b-d	5.5b-d
EcoGuard WP 140 5 oz [c]	7	6.0d	6.5ab	6.3b-d	5.8c	5.8bc	5.5c-e	5.5b-d
EcoGuard WP 145 1 oz	14	6.3cd	6.5ab	6.3b-d	6.3a-c	6.0bd	5.8b-d	5.5b-d
EcoGuard WP 140 5 oz [c]	14	6.0d	6.0b	5.8d	5.8c	5.5c	5.3de	5.8a-c
EXP 0357 5 lb	14	6.0d	6.3ab	6.0c-d	6.3a-c	6.0bc	6.0a-c	6.0ab
EXP 0357 10 lb	14	6.0d	6.5ab	6.5a-c	6.5a-c	6.5ab	6.0a-c	6.0ab
Compass 50WDG 0.25 oz	14	6.5bc	6.8a	6.8ab	6.8ab	6.5ab	6.0a-c	6.0ab
Eagle 20EW 0.3 oz	14	6.5bc	6.5ab	6.3b-d	6.3a-c	6.0bc	6.0a-c	5.8a-c
Eagle 40WSP 0.6 oz	14	6.3cd	6.5ab	6.8bab	7.0a	6.3a-c	6.3ab	6.0ab

[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] For these treatments, plots within the first replication suffered Pythium blight damage during the week of July 13. Symptoms associated with Pythium blight influenced turf quality ratings on subsequent evaluation dates.

[c] Treatments followed by the same letter within columns are not statistically different according to Fisher's unprotected means separation test, P=0.05.