

# 1996 RUTGERS Turfgrass Proceedings



THE NEW JERSEY TURFGRASS ASSOCIATION

In Cooperation With

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# **1996 RUTGERS TURFGRASS PROCEEDINGS**

**of the**

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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, Cook College, Rutgers University in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. It also allows these professionals to reach a more general audience, which includes the public. Articles appearing in these proceedings are divided into two sections.

The first section includes lecture notes of papers presented at the 1996 New Jersey Turfgrass Expo. Publication of the New Jersey Turfgrass Expo Notes provides a readily available source of information covering a wide range of topics. The Expo Notes include technical and popular presentations of importance to the turfgrass industry.

The second section represents performance of turfgrass cultivars and selections in New Jersey turf trials. The primary objective of these papers is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann B. Gould, Editor  
Dr. Bruce B. Clarke, Coordinator

## EVALUATION OF FUNGICIDES FOR THE CONTROL OF BROWN PATCH

Dr. Bruce B. Clarke, Pradip Majumdar, Saul Vaiciunas, and William K. Dickson<sup>1</sup>

Fungicides were evaluated in 1996 for their ability to control brown patch (*Rhizoctonia solani* Kuhn) at the Rutgers Turf Research Farm in North Brunswick, NJ. A colonial bentgrass (*Agrostis capillaris* 'SR7100') experimental fairway, established September 1994 on a Norton loam, was used for the study. Turf was maintained at a 3/8 inch mowing height. Nitrogen (N) was applied as 34-0-0 on 5 April (0.75 lb actual N/1000 ft<sup>2</sup>), 20-0-20 on 28 May (0.5 lb actual N/1000 ft<sup>2</sup>), 46-0-0 on 27 June (0.75 lb actual N/1000 ft<sup>2</sup>), and 20-0-20 on 10 September (0.5 lb actual N/1000 ft<sup>2</sup>). On 21 May, turf was aerified with 0.5 X 3 inch hollow tines on a 4 X 4 inch spacing. Turf was topdressed with 0.2 yd<sup>3</sup>/1000 ft<sup>2</sup> on 24 May. Insects were controlled with 1.5 oz Dursban 2E/1000 ft<sup>2</sup> on 11 July. Weeds were controlled with Betasan 4E at 10 qt/A on 3 May. Soil pH ranged from 6.1 to 6.2 over the test area. Plots were 3 X 9 ft and treatments were arranged in a randomized complete block with four replications. Turf was irrigated as needed to avoid drought stress.

Fungicides were applied on 21 June (all treatments), 27 June (7 day treatment only), 3 July (7 and 14 day treatments), 11 July (7 and 21 day treatments), 18 July (7, 14, and 28 day treatments), 25 July (7 day treatment only), 5 August (7, 14, and 21 day treatments), 9 August (7 day treatment only), and 15 August (7, 14, and 28 day treatments). Products were applied with a CO<sub>2</sub> compressed air sprayer, using TeeJet 8003 E nozzles, adjusted to 30 psi, in water equivalent to 1.9 gal/1000 ft<sup>2</sup>. Treatments were visually evaluated for percent turf area infested with *Rhizoctonia solani* on 2 July, 29 July, 9 August, 4 September, and 11 September. Turf was also rated for dollar spot (number of lesions centers per plot) and color (1 to 10 scale, where 10 = the darkest green color) on 12 and 16 August, respectively. Data were subjected to an arc-sine transformation prior to statistical analysis using an analysis of variance and Duncan Multiple Range Test (DMRT). A rating that exceeded 10% of the turf area infested with *R. solani* or more than 10 dollar spot lesions per plot was considered an unacceptable level of disease control.

Brown patch developed rapidly after 27 June. By 2 July, the natural infestation was evenly distributed throughout the test area. Excellent season-long control was obtained with treatments 4, 10, 13, 15, 16, 26-31, 34, 36-38, 41-43, 46, and 47, whereas good to excellent control was observed for treatments 1, 2, 5, 11, 12, 18, 23-25, 35, 49, and 52. The combination of Eagle 40W + Fore 80W, Bayleton 25DF + Daconil Ultrex 82.5SDG, and Bayleton 25DF + Prostar 50W (treatments 4, 35, and 36, respectively) improved brown patch control when compared to the individual component products alone. S-6873 G (treatments 53 and 54) provided excellent disease control after the third application on 18 July. Since colonial bentgrasses are fairly tolerant of dollar spot, most fungicides in this study provided excellent control. Certain products, however, actually enhanced symptom expression of this disease compared to the untreated control (i.e., treatments 38, 41, 42, 43, 46, 47, and 51). Although phytotoxicity was not observed, turf treated with sterol-inhibitors (treatments 1-5, 10-12, 18, 21-24, and 35-37), Daconil Ultrex (treatments 16, 17, 19, 20, 29, 34, and 35), or selected experimentals (treatments 13-15, 25-29, 44, 53, and 54) were noticeably greener than the untreated control.

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Table 1. Efficacy of selected fungicides for the control of brown patch on 'SR7100' colonial bentgrass maintained at 3/8 inch in North Brunswick, NJ.

Treatment and Rate/1000 ft <sup>2</sup>	Spray Interval (days) <sup>2</sup>	-----Turf Area Infested/Plot <sup>1</sup> (%)-----					Dollar Spot <sup>1</sup> 12 Aug.	Turf Color <sup>1</sup> 16 Aug.
		2 July	29 July	9 Aug.	4 Sept.	11 Sept.		
1 Eagle 40W 0.6 oz	14	9.0 m-g	8.8 l-p	12.5 m-o	4.2 i-n	6.8 h-j	0.5 a-c	9.2 ef
2 Eagle 40W 1.2 oz	14	8.2 l-q	2.8 e-j	13.0 m-p	2.8 d-l	0.2 ab	0.0 a	9.0 de
3 Eagle 40W 1.2 oz	21	14.2 r-t	7.5 l-o	24.2 s-u	5.8 l-p	13.5 m-o	1.0 a-d	9.0 de
4 A. Eagle 40W 0.6 oz	--	---	---	---	---	---	---	---
B. + Fore 80W 6.0 oz	14	0.2 a	0.2 ab	1.5 b-e	0.2 a	6.8 i-k	0.0 a	9.0 de
5 A. Eagle 40W 0.6 oz	--	---	---	---	---	---	---	---
B. /Fore 80W 6.0 oz	14 <sup>3</sup>	2.8 c-h	3.5 f-k	4.5 f-j	5.0 j-n	18.0 no	0.8 a-d	9.2 ef
6 Fore 80W 6.0 oz	14	1.0 a-d	7.2 k-o	20.2 qr	21.2 tu	56.0 vw	42.2 m-o	8.5 bc
7 Fore Flow 4F 9.6 fl oz	14	1.8 a-e	5.2 j-m	22.8 r-t	19.2 st	39.8 rs	38.0 m	8.5 bc
8 Fore Flow XF-96001 9.6 fl oz	14	3.8 c-j	15.0 q-s	19.2 p-r	23.5 t-w	39.5 rs	42.8 m-o	8.5 bc
9 Fore 75DG 6.0 oz	14	1.0 a-c	10.2 n-q	24.2 r-u	27.8 u-x	45.5 s-u	43.8 m-p	8.2 ab
10 A. Eagle 40W 0.6 oz	--	---	---	---	---	---	---	---
B. + FeSO <sub>4</sub> 2.0 oz	14	10.2 o-s	2.2 d-j	8.5 j-m	3.8 g-n	7.0 i-k	0.5 a-c	10.0 g
11 A. Eagle 40W 0.6 oz	--	---	---	---	---	---	---	---
B. /FeSO <sub>4</sub> 2.0 oz	14 <sup>4</sup>	12.2 p-s	2.5 e-j	5.2 h-k	3.0 e-m	1.5 b-f	1.5 b-e	10.0 g
12 A. FeSO <sub>4</sub> 2.0 oz	--	---	---	---	---	---	---	---
B. /Eagle 40W 0.6 oz	14 <sup>4</sup>	11.5 o-s	1.5 b-g	5.5 i-k	2.0 c-j	3.8 e-h	1.8 b-d	10.0 g
13 IB11924 6SC 2.75 fl oz	14	1.2 a-e	0.2 ab	3.8 e-i	2.2 c-j	1.5 a-e	0.5 a-c	9.0 de
14 IB11924 6SC 2.75 fl oz	21	5.0 g-m	2.0 c-h	10.8 lm	5.8 k-o	19.8 o	1.8 c-e	8.8 cd
15 IB11924 6SC 2.75 fl oz	28	8.2 l-p	1.5 b-g	7.2 i-l	3.8 g-n	4.0 d-h	3.0 ef	9.0 de
16 Daconil Ultrex 82.5SDG 3.8 oz	14	2.2 a-e	0.2 ab	1.0 a-c	0.8 ab	0.2 ab	0.5 a-c	9.0 de
17 A. Daconil Ultrex 82.5SDG 0.95 oz	--	---	---	---	---	---	---	---
B. + Banner Maxx 1.24MC 0.25 fl oz	14	4.0 e-l	9.8 m-q	28.2 s-v	25.0 t-w	37.0 q-s	0.0 a	8.8 cd
18 A. Daconil Ultrex 82.5SDG 1.9 oz	--	---	---	---	---	---	---	---
B. + Banner Maxx 1.24MC 0.25 fl oz	14	2.8 c-j	1.5 b-g	7.0 i-l	5.0 k-n	14.2 m-o	0.0 a	9.0 de
19 Daconil Ultrex 82.5SDG 0.95 oz	14	6.8 k-o	4.8 h-k	33.0 v	32.2 xy	54.5 uv	10.2 hi	9.0 de
20 Daconil Ultrex 82.5SDG 1.9 oz	14	3.2 c-h	1.8 b-h	21.0 q-s	10.0 p-r	37.0 p-s	4.0 f	9.0 de
21 Banner Maxx 1.24MC 0.25 fl oz	14	19.8 tu	28.0 t	44.2 w	29.2 v-y	45.2 s-u	2.0 d-f	9.0 de

Table 1 (continued).

Treatment and Rate/1000 ft <sup>2</sup>	Spray Interval (days) <sup>2</sup>	-----Turf Area Infested/Plot <sup>1</sup> (%)-----					Dollar Spot <sup>1</sup> 12 Aug.	Turf Color <sup>1</sup> 16 Aug.
		2 July	29 July	9 Aug.	4 Sept.	11 Sept.		
22 Banner Maxx 1.24MC 1.0 fl oz	14	2.5 c-h	4.2 g-k	16.8 n-q	9.8 o-r	18.5 no	0.0 a	9.0 de
23 Banner Maxx 1.24MC 2.0 fl oz	14	2.5 c-h	5.5 j-n	12.5 m-o	4.0 h-n	6.8 g-j	0.0 a	8.8 cd
24 A. Banner Maxx 1.24MC 1.0 fl oz	--	---	---	---	---	---	---	---
B. + Daconil Ultrex 82.5WDG 1.9 oz	14	2.5 c-h	1.5 b-g	10.5 lm	4.8 j-n	6.5 h-j	0.0 a	9.2 ef
25 CGA-BMP 46.5W 0.56 oz	14	2.2 c-g	2.0 c-h	5.8 h-k	6.8 n-q	12.0 k-n	0.0 a	9.0 de
26 CGA-BMP 46.5W 1.12 oz	14	1.5 a-d	0.8 a-e	0.8 a-c	1.2 b-e	2.0 b-f	0.0 a	9.5 f
27 CGA 173506 50W 0.25 oz	7	3.2 d-k	0.5 a-c	0.2 a	0.2 a	3.2 d-g	1.0 a-d	9.0 de
28 CGA 173506 50W 0.5 oz	14	8.0 l-p	2.2 d-j	4.2 f-j	2.0 c-i	7.8 j-l	11.5 hi	8.8 cd
29 A. CGA 329351 2MC 1.0 fl oz	--	---	---	---	---	---	---	---
B. + Daconil 2787 4F 6.5 fl oz	14	3.5 d-k	0.8 a-e	6.8 i-l	1.8 b-i	1.8 a-d	0.0 a	9.0 de
30 A. Polyoxorim 2.5W 4.0 oz	--	---	---	---	---	---	---	---
B. + EH 1259 2% v/v	14	4.5 f-l	3.0 e-j	3.0 c-g	2.0 b-h	0.5 a-c	36.2 m	8.2 ab
31 A. Polyoxorim 11.25DF 0.8 oz	--	---	---	---	---	---	---	---
B. + EH 1259 2% v/v	14	3.5 c-i	3.0 c-j	6.5 i-l	1.2 a-d	0.0 a	37.0 m	8.0 a
32 Companion I 4.0 fl oz	28 <sup>7</sup>	26.2 u	31.8 t	30.2 uv	29.5 w-y	61.0 vw	49.0 op	8.0 a
33 Companion II 4.0 fl oz	28 <sup>7</sup>	26.2 u	47.0 u	46.0 w	33.5 xy	53.0 t-v	36.8 m	8.0 a
34 A. Sentinel 40WG 0.167 oz	--	---	---	---	---	---	---	---
B. /Daconil Ultrex 82.5WDG 3.8 oz	14 <sup>5</sup>	1.5 b-e	0.2 ab	0.5 ab	1.0 a-c	1.0 a-e	0.2 ab	9.0 de
35 A. Bayleton 25DF 0.5 oz	--	---	---	---	---	---	---	---
B. + Daconil Ultrex 82.5WDG 1.9 oz	14	3.2 d-k	1.8 c-i	9.5 k-m	2.2 d-j	14.5 m-o	0.0 a	9.0 de
36 A. Bayleton 25DF 1.0 oz	--	---	---	---	---	---	---	---
B. + Prostar 50W 2.0 oz	28	6.5 j-o	4.8 i-l	2.5 e-h	2.8 d-k	2.0 c-f	1.5 b-e	9.0 de
37 A. Bayleton 25DF 1.0 oz	--	---	---	---	---	---	---	---
B. + Heritage 50WG 0.4 oz	28	1.8 c-f	1.0 b-f	1.2 b-e	2.0 b-i	0.5 a-c	0.2 ab	9.0 de
38 Heritage 50WG 0.4 oz	28	2.8 c-h	0.8 a-d	1.0 a-d	1.2 b-f	1.0 a-c	68.2 r	8.5 bc
39 Bayleton 25DF 1.0 oz	28	11.5 o-s	18.5 s	27.8 s-v	22.5 t-v	29.0 pq	2.0 d-f	8.2 ab
40 Bayleton 25DF 0.5 oz	14	10.8 o-s	14.2 p-s	29.2 t-v	14.2 rs	28.2 p	0.8 a-d	8.5 bc
41 Prostar 50W 2.0 oz	28	10.2 n-r	4.2 g-k	5.2 h-j	6.0 m-p	8.5 j-m	58.2 q	8.0 a
42 DAS 0025 100SL 0.39 oz	21	2.2 c-h	1.2 b-f	3.5 d-h	3.5 f-n	4.8 f-i	52.0 pq	8.5 bc
43 DAS 0025 100SL 0.77 oz	21	2.8 c-i	1.0 b-e	1.8 b-e	1.8 b-i	2.0 b-f	58.2 q	8.2 ab
44 DAS 0076 250EC 0.25 oz	21	16.5 st	16.2 rs	22.2 q-t	35.2 yz	65.0 w	15.2 ij	9.0 de

Table 1 (continued).

Treatment and Rate/1000 ft <sup>2</sup>	Spray Interval (days) <sup>2</sup>	-----Turf Area Infested/Plot <sup>1</sup> (%)-----					Dollar Spot <sup>1</sup> 12 Aug.	Turf Color <sup>1</sup> 16 Aug.
		2 July	29 July	9 Aug.	4 Sept.	11 Sept.		
45 DAS 0076 250EC 0.50 oz	21	6.2 i-o	5.8 j-m	10.8 lm	14.0 rs	33.8 p-r	4.0 fg	8.0 a
46 S-6806 G 40 oz	14 <sup>6</sup>	5.5 h-n	1.2 b-f	4.0 e-i	1.2 b-f	2.0 b-e	79.0 s	8.2 ab
47 S-6806 G 80 oz	14 <sup>6</sup>	1.8 a-e	1.5 a-d	0.8 a-d	1.2 a-e	1.0 a-c	78.5 rs	8.2 ab
48 A. EXP 10715A 80WG 4.0 oz	14	---	---	---	---	---	---	---
B. + Dithane 75WG 4.0 oz	14	0.5 ab	8.8 k-o	18.2 o-r	29.0 v-y	38.8 rs	27.5 l	8.0 a
49 A. EXP 10715A 80WG 8.0 oz	14	---	---	---	---	---	---	---
B. + Dithane 75WG 8.0 oz	14	0.2 a	0.0 a	3.5 e-i	5.2 k-n	18.2 no	18.0 jk	8.2 ab
50 A. EXP 10704A 80W 4.0 oz	14	---	---	---	---	---	---	---
B. + Dithane 75WG 4.0 oz	14	0.8 a-c	9.2 l-p	22.2 q-t	24.8 t-w	54.2 uv	39.5 mn	8.0 a
51 EXP 10715A 80WG 8.0 oz	14	5.2 e-l	10.8 o-r	22.0 q-t	19.0 st	44.0 st	46.8 n-p	8.0 a
52 A. Chipco Aliette 80WG 4.0 oz	--	---	---	---	---	---	---	---
B. + Fore 80W 8.1 oz	14	1.2 a-d	0.0 a	1.8 b-d	3.2 b-h	13.2 l-o	0.0 a	8.5 bc
53 S-6873 G 40 oz	14 <sup>6</sup>	14.2 q-t	5.0 j-m	2.0 c-f	3.2 d-m	0.5 a-c	23.2 kl	9.0 de
54 S-6873 G 83 oz	14 <sup>6</sup>	20.8 tu	4.5 i-l	2.0 c-f	2.0 b-g	0.5 a-c	8.0 gh	9.0 de
55 Dithane 75WG 8.0 oz	14	3.8 c-j	5.8 i-l	12.2 mn	11.0 qr	34.8 p-r	23.0 kl	8.2 ab
56 Untreated Check	--	46.2 u	54.8 u	72.0 x	41.0 z	64.2 w	36.8 m	8.0 a

<sup>1</sup> Means in a column followed by the same letter are not significantly different (DMRT,  $P = 0.05$ ). Values are means of four replicates. 12 Aug = number of dollar spot lesion centers/plot. Turf color was evaluated on a 1 to 10 scale, where 10 = darkest green color.

<sup>2</sup> Fungicides were applied on 21 June (all treatments), 27 June (7 day treatment only), 3 July (7 and 14 day treatments), 11 July (7 and 21 day treatments), 18 July (7, 14, and 28 day treatments), 25 July (7 day treatment only), 5 August (7, 14, and 21 day treatments), 9 August (7 day treatment only), and 15 August (7, 14, and 28 day treatments).

<sup>3</sup> Treatment 5A was applied 21 June, 18 July, and 15 August only; Treatment 5B was applied on 3 July and 5 August only.

<sup>4</sup> For treatments 11 and 12, the "A" component was allowed to dry on the turf before the "B" component was applied.

<sup>5</sup> Treatment 34 was applied as a tank mix on 21 June; Turf was then sprayed with treatment 34B on 3 July and 5 August, and treatment 34A on 18 July and 15 August.

<sup>6</sup> Treatments 46, 47, 53, and 54 were watered into the thatch with 1 gal water/plot post application.

<sup>7</sup> Treatments 32 and 33 were applied on a 28-day schedule (21 June and 18 July) and then on a 14-day schedule on 5 August and 15 August.