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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. Through this forum, these professionals also 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 1998 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 includes research papers containing original research findings and reviews covering selected subjects in turfgrass science. The primary objective of this section is to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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EVALUATION OF FUNGICIDES FOR THE CONTROL OF BROWN PATCH ON COLONIAL BENTGRASS FAIRWAYS

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Fungicides were evaluated for their ability to control brown patch (caused by the fungus *Rhizoctonia solani*) at the Rutgers Turf Research Farm in North Brunswick, NJ on colonial bentgrass cv. SR 7100 maintained under golf course fairway conditions. The turf was established in September 1995 on a Norton loam with a pH of 6.1. Mowing was performed three times weekly at a height of 0.4 inches with clippings collected, and the site was irrigated to prevent drought stress. Fertilizer was applied as 20-0-20 on 1 April (0.5 lb N/1000 ft²), 46-0-0 on 1 May (0.25 lb N/1000 ft²), and 16-4-8 on 14 July (0.5 lb N/1000 ft²). Insect pests were suppressed with Dursban Pro 2E (2 oz/1000 ft²) on 6 July. Daconil Ultrex 82.5WDG (2.9 oz/1000 ft²) was applied on 15 June to reduce a dollar spot infestation. Primer wetting agent (4 fl oz/1000 ft²) was applied on 8 April, 2 June, and 29 June, and Aquaduct wetting agent (6 fl oz/1000 ft²) was applied on 30 July to control localized dry spots. Solid tine aerification was performed on 24 July with 0.375 inch tines on 2 inch centers. Water injection cultivation was performed on 29 July with a Toro Hydroject (11.2 gal water/1000 ft² at 5000 psi). Plots were 3 ft x 9 ft and were arranged in a randomized complete block with four replications.

Fungicides were applied in water equivalent to 2 gal/1000 ft² with a CO₂ powered sprayer at 30 psi using TeeJet 8003E nozzles. Treatments were initiated on 25 June, except treatments 48 to 57, which were initiated on 22 July. Fungicides were reapplied at the appropriate intervals as indicated in the Table 1. Percent turf area

infested with *R. solani* was assessed on 20 July, 22 July (data not shown), 6 August, 12 August, 1 September, and 18 September. Data were subjected to analysis of variance and means separation by Waller-Duncan *k*-ratio *t*-test (*k* = 100).

Brown patch infection was first observed on 13 July. Disease pressure was moderate but consistent throughout July and August. On 20 July, excellent brown patch control was obtained with all treatments except for the low rates of BAS505F 50DF (trt 24) and RU011322 (trt 30). On 6 August, 14 and 21 day treatments were at the end of their application intervals. On that date, plots treated with Medallion 50W + Primo L 1E (trt 7), low rates or long application intervals of Daconil WeatherStik 6F (trt 13, 15), Prostar 70W (trt 16, 17), the 0.15 oz and 0.22 oz rates of BAS505F 50DF (trt 24, 25), AE B066752 (trt 29), RU011322 (trt 30, 31), Eagle 40W (trt 38), Fore 80W (trt 39), and the low rate of S-8172 (trt 43) had significantly more disease than those treatments providing the best level of control. Many treatments continued to provide excellent residual control on 12 August, 1 September, and 18 September, even though the application intervals had been significantly extended. Of the treatments involving curative applications (trt 48 to 57), Heritage 50WG (trt 56, 57) applications reduced brown patch infection to acceptable levels by 6 August. Treatments of RU181603D 4SC (trt 52, 53) and Chipco Triton 1.67SC (trt 54, 55) reduced disease to acceptable levels by 12 August and 1 September, respectively.

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Table 1. Impact of fungicides on the severity of brown patch on colonial bentgrass in North Brunswick, NJ: 1998.

Treatment and rate/1000 sq ft	Spray interval (days) ²	Turf area infected (%)/plot ¹				
		20 July	6 Aug.	12 Aug.	1 Sept.	18 Sept.
1. Cleary 3336 50W 4.0 oz.....	14	0.0 a	1.8 a-g	6.2 cde	7.8 d-g	17.0 k-o
2. Spectro 90WDG 8.0 oz	14	0.0 a	0.8 abc	0.0 a	0.8 ab	14.8 i-n
3. WAC-75 3.0 oz	14	0.0 a	0.2 ab	2.0 a-d	3.2 a-d	16.2 j-n
4. WAC-76 3.0 oz	14	0.0 a	1.8 a-g	5.8 b-e	1.5 ab	13.8 h-m
5. RU200112W 0.96 oz	14	0.2 a	0.2 ab	1.0 ab	1.5 ab	11.2 e-k
6. RU200112W 1.44 oz	14	0.0 a	0.0 a	0.2 a	0.8 ab	10.0 d-k
7A. Medallion 50W 0.31 oz	—	—	—	—	—	—
B. + Primo L 1E 0.1 fl oz	14	2.2 ab	27.5 mn	23.8 ij	18.0 ijk	21.8 n-r
8. CGA-279'202 50W 0.1 oz	14	0.5 a	0.0 a	0.5 a	2.5 abc	12.5 g-m
9. CGA-279'202 50W 0.15 oz	14	1.5 ab	0.5 ab	0.8 ab	2.8 abc	4.0 a-f
10A. CGA-279'202 50W 0.1 oz	—	—	—	—	—	—
B. + Banner Maxx 1.24MC 0.5 fl oz.....	21	0.0 a	0.0 a	0.0 a	1.0 ab	2.5 a-d
11A. Banner Maxx 1.24MC 1.0 fl oz	—	—	—	—	—	—
B. + Daconil WeatherStik 6F 6.0 fl oz	21	0.0 a	1.2 a-e	3.0 a-d	2.2 abc	7.5 a-i
12. Banner Maxx 1.24MC 2.0 fl oz	14	0.0 a	2.0 a-g	13.8 fg	4.0 a-d	13.0 h-m
13. Daconil WeatherStik 6F 2.0 fl oz.....	14	0.2 a	12.0 k	44.0 lm	18.5 jkl	27.0 pqr
14. Daconil WeatherStik 6F 4.0 fl oz.....	14	0.0 a	1.2 a-e	4.5 a-d	5.5 b-e	8.8 b-j
15. Daconil WeatherStik 6F 4.0 fl oz.....	21	0.0 a	6.5 g-j	24.8 j	13.2 hi	28.2 r
16. ProStar 70W 1.5 oz	21	0.2 a	8.2 ijk	4.8 a-d	6.8 c-f	17.5 k-o
17. ProStar 70W 2.25 oz	21	0.5 a	5.5 c-i	0.2 a	2.2 abc	1.2 ab
18. ProStar 50W 2.0 oz	14	0.0 a	2.2 a-g	2.0 a-d	2.5 abc	17.5 k-o
19. ProStar 50W 3.0 oz	21	0.5 a	1.5 a-f	0.8 ab	2.0 abc	5.0 a-g
20A. ProStar 70W 1.5 oz	—	—	—	—	—	—
B. + Daconil WeatherStik 6F 4.0 fl oz	21	0.0 a	0.5 ab	1.8 a-d	1.2 ab	7.5 a-i
21. BAS500F 2.1EC 0.28 fl oz	14	0.2 a	0.2 ab	0.5 a	0.2 a	2.5 a-d

(continued)

Table 1 (continued).

Treatment and rate/1000 sq ft	Spray interval (days) ²	Turf area infected (%)/plot ¹				
		20 July	6 Aug.	12 Aug.	1 Sept.	18 Sept.
22. BAS500F 2.1EC 0.42 fl oz	14	0.0 a	0.0 a	0.0 a	0.0 a	2.0 abc
23. BAS500F 2.1EC 0.53 fl oz	28	0.0 a	0.0 a	1.0 ab	16.8 ijk	8.8 b-j
24. BAS505F 50DF 0.15 oz	14	6.0 b	6.0 e-i	2.2 a-d	2.5 abc	7.8 a-i
25. BAS505F 50DF 0.22 oz	14	2.0 ab	11.5 ijk	5.8 b-e	4.5 a-d	9.8 c-k
26. BAS505F 50DF 0.28 oz	28	2.0 ab	3.0 a-h	3.2 a-d	17.2 ijk	1.2 ab
27A. RU020119A 0.42 fl oz	—	—	—	—	—	—
B. + RU020119B 0.11 fl oz	14	0.2 a	0.0 a	0.0 a	1.0 ab	3.8 a-e
28A. RU020119A 0.28 fl oz	—	—	—	—	—	—
B. + RU020119B 0.14 fl oz	14	0.2 a	0.5 ab	0.2 a	0.2 a	1.2 ab
29. AE B066752 4.0 oz	14	0.0 a	9.2 ijk	45.2 lm	19.8 kl	19.5 l-p
30. RU011322 0.25 fl oz	14 ⁴	26.0 e	32.2 no	32.2 k	11.8 gh	20.0 m-q
31. RU011322 0.5 fl oz	14 ⁴	3.2 ab	35.0 o	41.2 l	16.8 ijk	16.0 j-n
32. F-155 20W 1.33 oz	14	0.0 a	0.2 ab	0.8 ab	0.8 ab	6.2 a-h
33. F-155 20W 2.0 oz	14	0.0 a	1.2 a-e	0.2 a	0.2 a	7.0 a-i
34. F-155 20W 2.67 oz	14	0.2 a	2.8 a-g	1.8 a-d	1.0 ab	6.5 a-h
35. Heritage 50WG 0.22 oz	14	1.2 a	1.2 a-e	1.0 ab	0.8 ab	1.5 ab
36. Heritage 50WG 0.2 oz	21	0.2 a	1.0 a-d	0.8 ab	0.2 a	7.5 a-i
37. Heritage 50WG 0.4 oz	28	0.0 a	0.0 a	0.0 a	1.0 ab	1.2 ab
38. Eagle 40W 0.6 oz	14	2.2 ab	5.8 d-i	10.8 ef	4.0 a-d	6.5 a-h
39. Fore 80W 8.0 oz	14	0.0 a	28.0 mn	19.0 ij	17.2 ijk	11.8 f-l
40A. Eagle 40W 0.6 oz	—	—	—	—	—	—
B. /OR Fore 80W 8.0 oz	14 ⁵	3.0 ab	0.2 ab	6.8 de	10.0 e-h	37.8 s
41A. Eagle 40W 0.6 oz	—	—	—	—	—	—
B. /OR Heritage 50WG 0.2 oz	14 ⁵	0.0 a	0.2 ab	1.2 abc	0.2 a	1.2 ab
42. RH0611F 12.0 oz	14	0.8 a	0.8 abc	2.5 a-d	0.0 a	0.0 a
43. S-8172 6.0 fl oz	14	0.5 a	5.0 b-i	24.2 j	32.5 m	27.5 qr

(continued)

Table 1 (continued).

Treatment and rate/1000 sq ft	Spray interval (days) ²	Turf area infected (%)/plot ¹				
		20 July	6 Aug.	12 Aug.	1 Sept.	18 Sept.
44. S-8172 8.0 fl oz	14	0.0 a	0.2 ab	4.8 a-d	23.0 l	28.0 r
45. S-8206 3.2 fl oz	14	0.8 a	0.5 ab	1.8 a-d	4.0 a-d	26.2 pqr
46. S-8206 6.4 fl oz	14	0.5 a	1.5 a-f	0.8 ab	1.2 ab	8.8 b-j
47. Chipco 26GT 2SC 4.0 fl oz	14	0.8 a	0.8 abc	10.5 ef	19.0 kl	21.8 n-r
48. Chipco 26GT 2SC 2.0 fl oz	Cur. ³	24.2 cde	11.2 jk	28.5 jk	13.8 hij	38.2 s
49. Chipco 26GT 2SC 3.0 fl oz	Cur. ³	23.5 cde	23.0 l	27.0 j	10.0 e-h	24.5 o-r
50. Chipco 26GT 2SC 4.0 fl oz	Cur. ³	24.0 cde	9.8 ijk	24.2 j	11.5 fgh	26.2 pqr
51. RU181603D 4SC 0.3 fl oz	Cur. ³	21.2 cd	3.0 ijk	13.5 fg	0.2 a	11.8 f-l
52. RU181603D 4SC 0.6 fl oz	Cur. ³	24.8 de	6.2 f-i	3.0 a-d	1.0 ab	0.0 a
53. RU181603D 4SC 1.0 fl oz	Cur. ³	23.2 cde	7.8 h-k	2.5 a-d	1.5 ab	5.0 a-g
54. Chipco Triton 1.67SC 0.5 fl oz	Cur. ³	20.8 cd	23.5 m	18.0 gh	2.5 abc	3.8 a-e
55. Chipco Triton 1.67SC 1.0 fl oz	Cur. ³	23.8 cd	18.5 l	25.2 j	0.5 a	2.5 a-d
56. Heritage 50WG 0.2 oz	Cur. ³	20.0 c	2.0 a-g	0.0 a	0.0 a	0.0 a
57. Heritage 50WG 0.4 oz	Cur. ³	21.0 cd	0.5 ab	0.0 a	0.8 ab	2.5 a-d
58. Untreated Check	—	34.8 f	44.0 p	47.8 m	19.5 kl	57.8 t
	INT ⁶	DAT ⁷	DAT	DAT	DAT	DAT
	14	11	15	1	21	38
	21	4	21	1	21	38
	28	25	15	21	42	59
	Cur.	—	15	1	21	38

¹ Values are means of four replicates. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test (*k* = 100).

Table 1 (continued).

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- ² Fungicides were applied 25 June (all treatments), 9 July (14 day treatments), 16 July (21 day treatments), 22 July (14 and 28 day treatments), and 11 Aug. (14 and 21 day treatments).
 - ³ Treatments applied on a curative basis. Applications were initiated on 22 July and repeated on 11 Aug.
 - ⁴ Treatments 30 and 31 were applied at 0.5 fl oz and 1.0 fl oz, respectively, on 25 June. Treatments were reapplied at 0.25 fl oz and 0.5 fl oz, respectively, for subsequent applications due to phytotoxicity (foliar chlorosis) observed on 30 June at the 0.5 and 1.0 fl oz rates.
 - ⁵ Treatments 40A and 41A were applied on 25 June and 9 July; treatments 40B and 41B were applied in 22 July and 11 Aug.
 - ⁶ Spray interval in days.
 - ⁷ Days after treatment (DAT) for each spray interval.