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The first section includes lecture notes of papers presented at the 1999 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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Dr. Ann B. Gould, Editor
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EVALUATION OF CHEMICAL AND BIOLOGICAL FUNGICIDES FOR THE CONTROL OF SUMMER PATCH ON KENTUCKY BLUEGRASS

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Fungicides were evaluated in 1999 for their ability to control summer patch (caused by *Magnaporthe poae*) on Kentucky Bluegrass (*Poa pratensis* 'Baron') at the Rutgers Turf Research Farm in North Brunswick, New Jersey. Turf was established in September 1992 on a Norton loam soil with a pH of 6.1. Mowing was performed two times weekly at a height of 1.5 inches with clippings returned. The site was irrigated to prevent drought stress.

Pelletized lime (24 lb/1000 ft^2) was applied on 14 April. Fertilizer was applied as 15-0-0 on 15 April (0.75 lb N/1000 ft^2), 3 June (0.8 lb N/1000 ft^2), 16 July (0.5 lb N/1000 ft^2), and 11 August (0.75 lb N/1000 ft^2). On 19 April, Dimension 1E (1 fl oz/1000 ft^2) was applied for preemergence weed control, and Acclaim Extra 0.57E (0.64 fl oz/1000 ft^2) was used for the suppression of broadleaf weeds. Insect pests were controlled with Dursban Pro 2E (2 fl oz/1000 ft^2) on 14 July. 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 4 gal/1000 ft^2 with a CO_2 powered sprayer at 30 psi using TeeJet 8003E nozzles. Treatments (trt) were initiated on 14 June when the maximum soil temperature at a 2 inch depth exceeded 65°F for five consecutive days. Fungicides were reapplied at the appropriate intervals as indicated in Table 1. Turf had been previously inoculated in three locations per plot on 28 May 1998 with 25 cc of oat grain infested with *Magnaporthe poae* isolate 73-15. Percent turf area exhibiting foliar symptoms of summer patch was assessed on 2 August, 13 August, 26 August, 7 September, and 22 September. Data were subjected to analysis of variance and means separation by Waller-Duncan *k*-ratio *t*-test (k =100) following arcsine transformation.

Summer patch symptoms were first noticed on 26 July. Disease pressure was moderate throughout the study. Excellent season-long control of summer patch was provided with the 0.2 oz (14 day interval) and 0.4 oz (28 day interval) rates of Heritage 50WG (trt 1 and trt 4 to 6, respectively), DAS 0076 250SC (trt 9, 10), S-8322 (trt 22), S-8323 (trt 23), BAS 505 50WG (trt 27), and Companion I + Heritage 50WG (trt 37). When compared to the 0.2 oz rate of Heritage 50WG (trt 3) alone, the combination of the biological Companion I and Heritage 50WG (trt 37) resulted in significantly better control of summer patch on 7 September.

In general, post-treatment irrigation had little effect on the efficacy of Heritage 50WG (trt 4 to 6). Heritage 50WG (the 0.1 and 0.2 oz rates applied every 28 days, trt 2, 3), Heritage 50WG + Daconil Ultrex 82.5SDG (trt 7), the high rates of Chipco Triton 1.67SC (trt 14), TADS 12529 70WG (trt 16), and F-155 20W (trt 30), Cleary 3336 50W (trt 17), WAC 79 alternated with Cleary 3336 50W (trt 18), S-7395 G (trt 21), BAS 500 2.1E (trt 24 to 26), Banner Maxx 1.3MC (trt 31, 32), Companion I (trt 33, 34), and Companion I + Banner Maxx 1.3MC (trt 35), the 0.1 oz rate of Heritage 50WG (trt 36), or Cleary 3336 50W (trt 38) also provided good to excellent

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suppression of summer patch throughout most of the summer. The microbial inoculant P.G.A. Plus W (trt 39) provided acceptable disease control until 7 September, 14 DAT. When applied on a preventive basis (4 August), one 1.6 oz application of ammonium sulfate (trt 40) significantly reduced symptom expression 9 to 34 DAT, compared to the untreated check (trt 41). No phytotoxicity was observed.

Table 1. Impact of chemical and biological fungicides on the incidence of summer patch on Kentucky bluegrass in North Brunswick, NJ: 1999.

Treatment and rate/1000 sq ft	Spray interval (days)[2]	Turf area infected (%)/plot[1]				
		2 Aug.	13 Aug.	26 Aug.	7 Sept.	22 Sept.
1. Heritage 50WG 0.2 oz	14	8.0 a-i	6.8 d-l	4.5 a-e	5.8 b-f	1.2 ab
2. Heritage 50WG 0.1 oz	28	6.5 a-i	7.0 d-m	5.2 a-e	16.0 i-p	7.2 b-g
3. Heritage 50WG 0.2 oz	28	7.0 a-i	6.5 b-k	4.8 a-e	15.2 h-n	3.0 a-d
4. Heritage 50WG 0.4 oz	28[3]	7.8 a-i	5.0 b-h	3.5 a-d	2.8 a-c	0.0 a
5. Heritage 50WG 0.4 oz	28[3]	6.3 a-h	0.0 a	2.8 a-c	3.0 ab	6.5 b-f
6. Heritage 50WG 0.4 oz	28[3]	1.5 a	1.2 ab	0.0 a	0.0 a	0.0 a
7. Heritage 50WG 0.4 oz + Daconil Ultrex 82.5SDG 3.67 oz	28[3]	13.8 hi	6.2 c-l	1.8 ab	6.2 b-f	9.5 c-h
8. DAS 0076 250SC 0.38 fl oz	28	13.0 g-i	14.5 mn	24.2 mn	26.5 pq	16.2 g-i
9. DAS 0076 250SC 0.57 fl oz	28	4.0 a-e	6.5 b-k	4.5 a-e	8.0 d-h	0.0 a
10. DAS 0076 250SC 0.77 fl oz	28	5.3 a-g	3.2 a-d	3.2 a-d	4.2 b-d	0.0 a
11. DAS 0025 250SC 0.77 fl oz	28	10.0 c-i	11.5 lm	12.2 g-m	15.2 h-n	3.5 a-e
12. Chipco Triton 1.67SC 0.5 fl oz	28	11.2 e-i	10.8 k-m	17.0 k-m	24.5 n-q	10.0 c-h
13. Chipco Triton 1.67SC 1.0 fl oz	28	12.8 f-i	10.5 i-m	14.2 i-m	27.0 pq	10.8 d-h
14. Chipco Triton 1.67SC 1.5 fl oz	28	9.5 b-i	9.2 h-n	11.0 e-l	18.2 k-p	4.8 a-f
15. TADS 12529 70WG 0.15 oz	28	9.3 a-i	11.0 g-n	13.5 h-m	25.8 o-q	12.0 e-h
16. TADS 12529 70WG 0.30 oz	28	7.5 a-i	8.8 e-n	12.2 g-m	15.5 h-o	5.8 b-f
17. Cleary 3336 50W 8.0 oz	14	10.0 c-i	6.0 b-j	7.0 b-j	12.5 g-l	8.0 c-h
18. WAC 79 10.0 fl oz / Cleary 3336 50W 8.0 oz	14[4]	14.3 i	7.0 d-m	6.5 b-i	11.5 f-k	6.8 b-f
19. S-4693 G 43.5 oz	28[3]	6.5 a-i	10.0 h-n	17.8 lm	17.5 j-p	5.0 a-f
20. S-7511 G 128.0 oz	28[3]	10.8 d-i	8.5 e-n	15.8 km	20.2 l-p	12.0 e-h
21. S-7395 G 81.0 oz	28[3]	6.0 a-h	9.8 g-n	13.0 h-m	19.8 l-p	6.8 b-f
22. S-8322 G 38.5 oz	28[3]	4.3 a-e	4.8 a-g	4.0 a-d	9.8 d-i	0.0 a
23. S-8323 G 80.0 oz	28[3]	3.0 a-d	4.0 a-e	4.2 a-e	7.2 c-g	0.0 a

(continued)

Table 1 (continued).

Treatment and rate/1000 sq ft	Spray interval (days)[2]	Turf area infected (%)/plot[1]									
		2 Aug.		13 Aug.		26 Aug.		7 Sept.		22 Sept.	
24. BAS 500 2.1E 0.4 fl oz	14	5.0	a-f	7.2	d-m	5.5	a-f	10.8	e-j	1.8	ab
25. BAS 500 2.1E 0.7 fl oz	14	10.0	c-i	9.0	f-n	11.8	f-n	12.5	g-l	6.0	b-f
26. BAS 500 2.1E 0.7 fl oz	28	7.5	a-i	8.8	f-n	15.0	i-m	12.0	f-k	0.0	a
27. BAS 505 50WG 0.2 oz	14	7.5	a-i	5.5	b-i	6.2	b-h	5.2	b-e	3.8	a-e
28. F-155 20W 0.4 oz	28	23.5	j	15.5	no	23.5	mn	24.5	n-q	16.5	g-i
29. F-155 20W 0.8 oz	28	7.5	a-i	12.0	lm	15.5	j-m	23.5	m-q	13.0	f-h
30. F-155 20W 1.2 oz	28	8.8	a-i	9.2	g-n	11.8	f-m	18.5	k-p	3.2	a-d
31. Banner Maxx 1.3MC 2.0 fl oz	28	5.0	a-f	7.0	d-m	9.0	d-l	18.2	k-p	5.8	b-f
32. Banner Maxx 1.3MC 4.0 fl oz	28	5.5	a-g	5.2	b-h	3.2	a-d	13.8	g-m	0.8	ab
33. Companion I 4.0 fl oz	14	2.3	a-c	6.2	b-k	14.8	i-m	15.8	h-o	9.5	c-h
34. Companion I 8.0 fl oz	14	5.8	a-g	9.8	g-n	17.8	lm	17.8	j-p	10.0	c-h
35. Companion I 4.0 fl oz + Banner Maxx 1.3MC 2.0 fl oz	14 / 28[5]	2.0	ab	4.2	a-f	11.0	e-l	15.0	h-n	7.2	b-g
36. Companion I 4.0 fl oz + Heritage 50WG 0.1 oz	14 / 28[5]	5.5	a-g	8.0	e-n	8.8	c-k	13.5	g-l	5.2	a-f
37. Companion I 4.0 fl oz + Heritage 50WG 0.2 oz	14 / 28[5]	2.0	ab	1.5	a-c	1.8	ab	3.0	a-c	2.5	a-c
38. Companion I 4.0 fl oz + Cleary 3336 50W 8.0 oz	14 / 14	7.8	a-i	1.5	a-c	6.0	b-g	15.5	h-o	3.8	a-e
39. P.G.A Plus W 2.0 oz	14[6]	11.8	e-i	10.0	h-m	10.5	d-l	42.0	r	27.0	i
40. Ammonium Sulfate (21-0-0) 1.6 oz	Once[7]	28.4	jk	4.0	a-e	11.8	f-m	13.2	g-l	9.5	c-h
41. Untreated Check	---	39.3	k	27.0	o	37.8	n	34.5	qr	18.2	hi

(continued)

Table 1 (continued).

Treatment and rate/1000 sq ft	Spray interval (days)[2]	Turf area infected (%)/plot[1]				
		2 Aug.	13 Aug.	26 Aug.	7 Sept.	22 Sept.
	INT[8]	DAT[9]	DAT	DAT	DAT	DAT
	Once	---	9	22	34	49
	14	7	1	2	14	29
	28	20	1	14	26	41

[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).

[2] Fungicides were applied on 14 June (all treatments), 28 June (14 day treatment), 13 July (14 and 28 day treatments), 26 July (14 day treatment), 4 August (treatment 55 only), 12 August (14 and 28 day treatments), and 24 August (14 day treatment).

[3] Treatments 5, 7, and 19 to 23 were irrigated with 2 gal water per plot immediately following application; treatment 6 was irrigated with 2 gal water per plot 6 hr post-treatment; and treatment 4 was not irrigated after application.

[4] For treatment 18, WAC79 10.0 fl oz was applied on 14 June, 28 June, and 13 July, whereas Cleary 3336 50W 8.0 oz was applied on 26 July, 12 August, and 24 August after symptoms were observed on untreated check plots.

[5] For treatments 35 to 37, Companion I 4.0 fl oz was applied on 14 June, 28 June, 13 July, 26 July, 12 August, and 24 August, whereas the respective tank mix partners (Banner Maxx 1.3MC 2.0 fl oz, Heritage 50WG 0.1 oz, and Heritage 50WG 0.2 oz, respectively) were only applied on 14 June, 13 July, and 12 August.

[6] Treatment 39 was applied after 5 PM on dates indicated and was irrigated immediately with 2 gal water per plot.

[7] Treatment 40 was applied once on 4 August (at onset of symptoms) in 20 gal water per 1000 ft^2.

[8] Spray interval in days.

[9] Days after treatment (DAT) for each spray interval.