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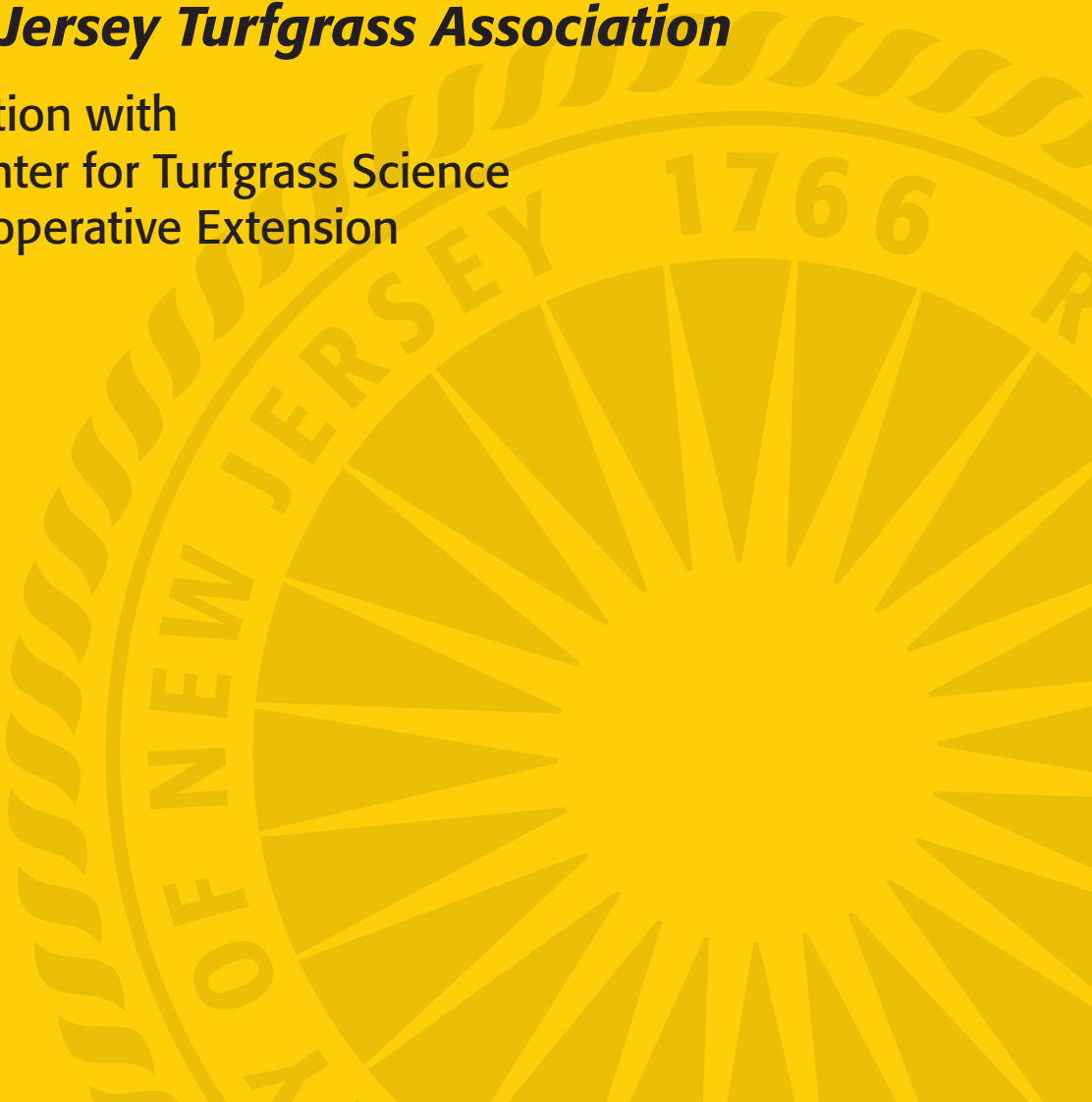

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of the

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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, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey 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.

This publication includes lecture notes of papers presented at the 2014 GREEN EXPO Turf and Landscape Conference. Publication of these lectures provides a readily available source of information covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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

SUPPRESSING SUMMER PATCH WITH SELECTED FUNGICIDES ON KENTUCKY BLUEGRASS, 2014

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Fungicides were evaluated in 2014 for their ability to control summer patch (caused by *Magnaporthe poae*) on Kentucky bluegrass (*Poa pratensis* cv. Baron) at the Rutgers Turf Research Farm in North Brunswick, NJ. Turf was established in September 2002 on a Norton loam soil with a pH of 6.6. Mowing was performed two times weekly at a height of 1.5 inches with clippings returned. The site was irrigated as needed to prevent drought stress and to encourage disease. Turf was inoculated on 15 May 2004 by removing 3-inch diameter x 3-inch deep circular sod cores with a cup cutter, placing 25 cc of oat grains infested with *M. poae* isolate OAK A-5 into each hole, replacing the cores, and irrigating the site to encourage rooting. Three inoculations (1.5 ft apart) were made per plot. Plots were 3 x 9 ft and treatments were arranged in a randomized complete block with four replications.

Dimension 2EW (0.37 fl oz per acre) was sprayed on 14 April for pre-emergence weed control, and yellow nutsedge (Cyperus esculentus) was eliminated from the site on 16 July with Dismiss 4L (0.092 fl oz per acre). Insect pests/billbugs were suppressed with Dylox 6.2G (1.6 lb per 1000 ft^2) on 14 August. Fertilizer was applied as 26-0-5 (0.75 lb nitrogen (N) per 1000 ft^2) on 25 November 2013.

Fungicides were applied in water equivalent to 4 gal per 1000 ft^2 with a CO_2 powered sprayer at 30 psi using 85025 air induction nozzles. Treatments (trt) were initiated on 22 May when the maximum soil temperature at a 2-inch depth exceeded 65°F for five consecutive days. Fungicides were reapplied at the predetermined intervals as indicated in Tables 1A to 1D. Turf area exhibiting foliar symptoms of summer patch was assessed as a disease severity index (DSI) on 30 July, 9, 19, and 29 August, and 8, 19, and 29 September. The DSI was calculated by multiplying the patch diameter of each infection center by the disease intensity of that patch. Disease intensity was assessed on a 0 to 3 scale, where 0 = no visual foliar necrosis, 1 = 1 to 33% necrotic foliage, 2 = 34 to 66% necrotic foliage, and 3 = 67 to 100% necrotic foliage within each patch. Patch diameter was recorded as the mean of two perpendicular measurements per infection center. Disease severity values were averaged for each plot. Percent area with green cover (density) per plot was recorded on 19 June, 17 July, 14 August, and 11 September. Turf quality was rated on 19 June, 17 July, 14 August, and 11 September using a 1 to 9 scale, where 9 = best turf quality and 5 = acceptable quality. Color of foliage was visually estimated on 19 June, 17 July, 14 August, and 11 September using a 1 to 5 scale, where 1 = very chlorotic turf, 2 = slight reduction in green color, 3 = normal green color of healthy turf, 4 = slight dark green color, 5 = very dark green color. Data were subjected to analysis of variance and means were separated by Waller-Duncan *k*-ratio *t*-test (*k* = 100).

Summer patch symptoms were first noticed on 18 July but did not become uniformly distributed throughout the study area until 30 July (Table 1A). The epidemic peaked at a DSI of 124 for untreated turf (trt 51) on 19 August, which was considered to be a severe disease outbreak. A DSI of less than 20 was considered an acceptable level of disease control. Of the 50 products in the study, 19 materials provided acceptable season long control of summer

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patch from 30 July to 29 September (Tables 1A and 1B). These included commercially available products such as Mirage 2SC (1.5 fl oz) + Nortica 10W (trt 12), Heritage 50WG @ 0.2 oz (trt 14), Velista 50WG + Heritage 50WG (trt 16), Heritage 50WG (trt 21), Velista 50WG + Heritage 50WG (trt 24), 2014 SP Program #1 (trt 28), Briskway 2.7SC (trt 31), 2014 SP Program #6 (trt 42), Tourney 50WG (trt 43), Banner Maxx 1.3ME @ 4.0 fl oz (trt 45), Ammonium Sulfate + Banner Maxx 1.3ME (trt 50), as well as the experimental materials RU-21196-14D SC @ 0.393 fl oz (trt 2), RU-21196-14D SC @ 0.786 fl oz (trt 3), RU-21196-14D SC + RU-21196-14F LC (trt 4), RU-21196-14D SC + RU-21196-14F LC (trt 7), A20964A WG @ 0.2 oz (trt 15), A20964A WG @ 0.4 oz (trt 20), A20581A SC @ 0.47 fl oz (trt 26), and 3336 4F (trt 37).

In addition, A20866A SC (trt 27) controlled summer patch during the application period of 20 July to 9 August (Tables 1A and 1B), whereas residual disease control (19 days post-treatment) was observed for turf treated with Ammonium Sulfate at 14-day intervals (trt 49). Moreover, 23 to 43 days residual control (20 July to 29 August) was afforded turf treated with RU-21196-14D SC (trt 1), RU-21196-14D SC @ 0.393 fl oz + RU-21196-14G SC @ 0.16 fl oz (trt 5), RU-21196-14D SC @ 0.393 fl oz + RU-21196-14G SC @ 0.21 fl oz (trt 6), Mirage 2SC @ 1.5 fl oz (trt 10), Mirage 2SC @ 1.0 fl oz + Nortica 10W (trt 11), Velista 50WG @ 0.3 oz (trt 13), Velista 50WG + A20964A WG (trt 17), Velista @ 0.5 oz 28 (trt 18), A20964A WG @ 0.2 oz (trt 19), Velista 50WG + A20964A WG @ 0.2 oz(trt 22), Velista 50WG + A20964A WG @ 0.4 oz (trt 23), 28A20581A SC @ 0.34 fl oz (trt 25), 2014 SP Program #2 (trt 29), Headway 0.5ME (trt 30), Xzemplar 2.5SC @ 0.21 fl oz (trt 34), Xzemplar 2.5SC @ 0.26 fl oz (trt 35), Lexicon 4.1SC (trt 36), Disarm T SC (trt 38), 2014 SP Program #5 (trt 41), Banner Maxx 1.3ME @ 2.0 fl oz (trt 44), and 3336 4F (trt 47). Ammonium Sulfate (trt 48) applied once at symptom expression on 24 July did not control the disease as well as the 14-day interval applications with this product (trt 49); however, enhanced residual control was observed when Banner Maxx 1.3ME @ 2.0 fl oz was applied with this fertizer (trt 50). While Banner Maxx 1.3ME alone @ 2.0 fl oz every two weeks (trt 44) provided effective summer patch control to 29 August, Banner Maxx 1.3ME @ 4.0 fl oz every 28 days (trt 45) provided season long control until 29 September.

In general, treatments that provided good summer patch control had acceptable turf density (72 to 88 % green cover per plot) during the trial (Table 1B). Although turf quality typically declined over the season, all treatments that effectively suppressed summer patch provided better than acceptable turf quality ratings (greater or equal to 5.0) by 11 September, except 3336 4F (trt 47; Table 1C). Most treatments exhibited turf color equivalent to or darker green than untreated turf (trt 51) throughout the season (Table 1D). No phytotoxicity was observed in this study.

Table 1A. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2014.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Disease Severity Index[1,2] 30 July	9 Aug.	19 Aug.	29 Aug.	8 Sept.	19 Sept.
1	RU-21196-14D SC	0.197 fl oz	28	8.0 c-f	3.6 f	6.7 de	4.2 d	22.9 f-h	17.1 d-h
2	RU-21196-14D SC	0.393 fl oz	28	4.2 d-f	2.3 f	6.0 de	4.0 d	15.3 gh	12.9 e-h
3	RU-21196-14D SC	0.786 fl oz	28	1.5 f	1.8 f	7.7 de	5.2 cd	14.8 gh	11.2 f-h
4	RU-21196-14D SC	0.393 fl oz	–						
	+ RU-21196-14F LC	2.3 fl oz	28	0.0 f	0.8 f	0.0 e	0.0 d	10.2 h	2.3 gh
5	RU-21196-14D SC	0.393 fl oz	–						
	+ RU-21196-14G SC	0.16 fl oz	28	13.0 c-f	12.0 d-f	8.8 de	14.1 cd	29.9 e-h	15.9 d-h
6	RU-21196-14D SC	0.393 fl oz	–						
	+ RU-21196-14G SC	0.21 fl oz	28	7.3 c-f	14.0 d-f	13.3 c-e	10.5 cd	23.9 f-h	13.3 e-h
7	RU-21196-14D SC	0.393 fl oz	–						
	+ RU-21196-14H SC	0.47 fl oz	28	8.8 c-f	1.3 f	14.0 c-e	11.8 cd	16.5 gh	9.2 f-h
8	RU-21196-14H SC	0.47 fl oz	28	10.4 c-f	25.9 c-f	22.5 c-e	23.3 b-d	25.2 f-h	9.0 f-h
9	Mirage 2SC	1.0 fl oz	28[4]	14.2 c-f	21.8 d-f	14.5 c-e	18.3 b-d	29.7 e-h	16.5 d-h
10	Mirage 2SC	1.5 fl oz	28[4]	9.8 c-f	15.3 d-f	17.6 c-e	13.8 cd	21.0 f-h	13.4 e-h
11	Mirage 2SC	1.0 fl oz	–						
	+ Nortica 10W	12.9 oz	28[4]	12.8 c-f	16.2 d-f	8.0 de	16.8 cd	20.8 e-h	15.6 d-h
12	Mirage 2SC	1.5 fl oz	–						
	+ Nortica 10W	12.9 oz	28[4]	2.8 ef	3.1 f	3.5 de	0.0 d	7.8 h	0.0 h
13	Velista 50WG	0.3 oz	14	9.3 c-f	10.4 d-f	14.2 c-e	17.0 b-d	34.6 d-h	24.8 b-h
14	Heritage 50WG	0.2 oz	14	5.8 c-f	0.0 f	2.5 e	4.5 cd	10.8 h	6.7 f-h
15	A20964A WG	0.2 oz	14	4.0 d-f	1.3 f	0.0 e	3.7 d	7.3 h	0.7 gh
16	Velista 50WG	0.3 oz	–						
	+ Heritage 50WG	0.2 oz	14	3.2 d-f	3.3 f	0.0 e	0.0 d	14.4 h	11.3 f-h
17	Velista 50WG	0.3 oz	–						
	+ A20964A WG	0.2 oz	14	4.1 d-f	3.8 f	5.6 de	5.5 cd	21.8 f-h	10.7 f-h
18	Velista 50WG	0.5 oz	28	7.5 c-f	10.3 ef	14.0 c-e	14.1 cd	30.5 e-h	23.5 c-h
19	A20964A WG	0.2 oz	28	6.3 c-f	3.1 f	4.5 de	10.6 cd	21.7 f-h	12.8 e-h
20	A20964A WG	0.4 oz	28	4.3 d-f	2.3 f	3.0 de	2.5 d	17.3 gh	10.2 f-h
21	Heritage 50WG	0.4 oz	28	5.5 c-f	12.9 d-f	13.2 c-e	6.3 cd	19.1 f-h	11.0 f-h

(Continued)

Table 1A. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Disease Severity Index[1,2] 30 July	9 Aug.	19 Aug.	29 Aug.	8 Sept.	19 Sept.
22	Velista 50WG	0.5 oz	–						
	+ A20964A WG	0.2 oz	28	5.0 c-f	4.2 f	7.4 de	6.8 cd	22.5 f-h	12.9 e-h
23	Velista 50WG	0.5 oz	–						
	+ A20964A WG	0.4 oz	28	4.3 d-f	4.0 f	6.5 de	3.5 d	20.2 f-h	12.5 e-h
24	Velista 50WG	0.5 oz	–						
	+ Heritage 50WG	0.4 oz	28	7.5 c-f	4.5 f	4.7 de	2.3 d	16.8 gh	11.3 f-h
25	A20581A SC	0.34 fl oz	28	12.3 c-f	8.3 ef	6.7 de	15.2 cd	21.8 f-h	9.8 f-h
26	A20581A SC	0.47 fl oz	28	3.7 d-f	3.0 f	0.0 e	7.9 cd	11.2 h	9.1 f-h
27	A20866A SC	0.26 fl oz	28	5.5 c-f	16.3 d-f	23.8 c-e	28.8 b-d	11.3 h	7.4 f-h
28	2014 SP Program #1	Syngenta	ALT-28[5]	15.7 c-f	13.3 d-f	10.5 c-e	11.2 cd	6.1 h	4.0 f-h
29	2014 SP Program #2	Syngenta	ALT-21[6]	8.0 c-f	14.3 d-f	9.0 c-e	17.7 b-d	33.8 d-h	21.2 d-h
30	Headway 0.5ME	2.0 fl oz	14	4.3 d-f	10.4 d-f	6.0 de	7.7 cd	25.3 e-h	13.4 e-h
31	Briskway 2.7SC	0.3 fl oz	14	3.4 d-f	10.7 d-f	4.6 de	3.8 d	15.8 gh	7.3 f-h
32	2014 SP Program #3	Plant-food	14[7]	19.9 b-d	25.5 c-f	21.0 c-e	28.4 b-d	55.0 b-g	48.3 bc
33	2014 SP Program #4	Plant-food	14[8]	34.7 b	52.9 bc	32.8 cd	33.4 bc	76.4 a-c	39.8 b-d
34	Xzemplar 2.5SC	0.21 fl oz	21	6.2 c-f	10.0 ef	6.3 de	19.8 b-d	36.0 d-h	26.3 b-g
35	Xzemplar 2.5SC	0.26 fl oz	28	10.1 c-f	14.5 d-f	14.4 c-e	16.4 cd	23.3 f-h	20.7 d-h
36	Lexicon 4.1SC	0.47 fl oz	28	6.3 c-f	4.8 f	12.7 c-e	14.8 cd	58.8 b-f	13.5 e-h
37	ARY-0534-002 SC	0.33 fl oz	21	5.3 c-f	14.6 d-f	7.8 de	0.0 d	4.5 h	3.1 gh
38	Disarm T SC	0.66 fl oz	21	5.9 c-f	0.0 f	2.8 de	2.2 d	21.2 f-h	10.7 f-h
39	Disarm M 3.9SC	1.0 fl oz	21	18.8 b-e	34.4 c-e	12.3 c-e	13.8 cd	34.0 d-h	17.8 d-h
40	Disarm 480SC	0.36 fl oz	21	21.2 bc	26.8 c-f	18.5 c-e	26.0 b-d	39.3 c-h	24.9 b-h
41	2014 SP Program #5	Harrells	28[9]	7.3 c-f	12.2 d-f	15.6 c-e	11.0 cd	27.8 e-h	23.7 c-h
42	2014 SP Program #6	Harrells	14[10]	0.0 f	2.3 f	2.5 e	2.0 d	9.7 h	4.8 f-h
43	Tourney 50WG	0.37 oz	14	1.8 f	2.2 f	0.0 e	0.0 d	14.8 gh	4.0 f-h
44	Banner Maxx 1.3ME	2.0 fl oz	14	0.0 f	3.2 f	1.3 e	8.3 cd	32.8 d-h	29.1 b-f
45	Banner Maxx 1.3ME	4.0 fl oz	28	3.0 ef	7.8 ef	3.0 de	4.8 cd	11.6 h	11.3 e-h
46	Daconil Ultrex 82.5WG	3.2 oz	14	55.0 a	65.2 b	80.6 b	91.9 a	109.8 a	81.5 a
47	3336 4F	4.0 fl oz	14	12.0 c-f	16.5 d-f	18.5 c-e	12.7 cd	71.5 a-d	47.5 bc

(Continued)

Table 1A. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Disease Severity Index[1,2] 30 July	9 Aug.	19 Aug.	29 Aug.	8 Sept.	19 Sept.
48	Ammonium Sulfate	0.2 lb	CUR-Once[11]	7.0 c-f	39.3 b-d	39.0 c	45.8 b	65.7 b-e	50.0 b
49	Ammonium Sulfate	0.2 lb	14	10.7 c-f	14.2 d-f	12.8 c-e	26.3 b-d	39.2 c-h	37.2 b-e
50	Ammonium Sulfate	0.2 lb	–						
	+ Banner Maxx 1.3ME	2.0 fl oz	14	2.8 ef	6.7 ef	4.5 de	6.1 cd	14.5 h	14.9 d-h
51	Untreated Check	–	–	56.9 a	119.4 a	123.8 a	97.8 a	93.5 ab	99.3 a
			INT[12]	DAT[13]	DAT	DAT	DAT	DAT	DAT
			14	13	9	19	29	39	50
			21	6	16	26	36	46	57
			28	13	23	33	43	53	64

[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). All fungicides were applied in 4.0 gal H_2O per 1000 sq ft with a CO_2 compressed air sprayer, T-Jet nozzle 8003E, at 30 psi.

[2] Disease severity index = patch diameter x disease intensity. Disease intensity was rated on a 0 to 3 scale, where 0 = no visual foliar necrosis, 1 = 1 to 33% necrotic foliage, 2 = 34 to 66% necrotic foliage, and 3 = 67 to 100% necrotic foliage. Patch diameter was recorded as the mean of two perpendicular measurements per infection center. Three locations were inoculated per 3 x 9 ft replicate plot with *Magnaporthe poae* isolate OAK A-5 on 15 May 2004. Disease severity values were averaged for each plot.

[3] Fungicides were applied on 22 May (all treatments; except treatments 32 and 33), 28 May (treatments 32 and 33), 5 June (14-day treatment), 12 June (21-day treatment), 19 June (14- and 28-day treatments), 3 July (14- and 21-day treatments), 17 July (14- and 28-day treatments), 24 July (21-day treatment), and 31 July (14-day treatment).

[4] Treatments 9 to 12 were irrigated with 0.5 gal of H_2O per plot immediately following application.

[5] ALT = alteration treatment, where treatment 28 (2014 Syngenta Summer Patch Program #1) consisted of Headway 0.8ME (3.0 fl oz) applied on 22 May, and Briskway 2.7SC (0.725 fl oz) on 19 June and 17 July.

[6] ALT = alteration treatment, where treatment 29 (2014 Syngenta Summer Patch Program #2) consisted of Briskway 2.7SC (0.6 fl oz) applied on 22 May and 3 July, and Velista 50WG (0.5 oz) on 12 June and 24 July.

[7] Treatment 32, 2014 SP Plant-food Program #3, consisted of 7-0-7 LC (12.0 fl oz) + Mn 5% LC (4.0 fl oz) + FloThru LC (4.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

(Continued)

Table 1A. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

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[8] Treatment 33, 2014 SP Plant-food Program #4, consisted of 7-0-7 LC (15.0 fl oz) + Mn 5% LC (8.0 fl oz) + FloThru LC (6.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[9] Treatment 41 (2014 Harrells Summer Patch Program #5) consisted of Lexicon Intrinsic 4.2SC (0.47 fl oz) + Earth Maxx LC (4.0 fl oz) + 4-0-0 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 28 days.

[10] Treatment 42 (2014 Harrells Summer Patch Program #6) consisted of Briskway 2.7SC (0.3 fl oz) + Earth Maxx LC (2.0 fl oz) + 4-0-0 LC (3.0 fl oz) + N30 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 14 days.

[11] Treatment 48 was applied once upon symptom expression on 24 July.

[12] INT = Spray interval in days.

[13] DAT = Days after the last treatment.

Table 1B. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2014.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[4]	Disease Severity Index[1,2]	Density[3]			
				29 Sept.	19 June	17 July	14 Aug.	11 Sept.
1	RU-21196-14D SC	0.197 fl oz	28	11.1 c-e	97.8 ab	96.5 a-c	88.3 a-e	84.3 a-e
2	RU-21196-14D SC	0.393 fl oz	28	6.3 de	96.5 ab	97.3 a-c	90.3 a-d	83.8 a-e
3	RU-21196-14D SC	0.786 fl oz	28	0.0 e	97.5 ab	97.8 ab	91.3 a-c	88.8 ab
4	RU-21196-14D SC	0.393 fl oz	–					
	+ RU-21196-14F LC	2.3 fl oz	28	6.5 de	98.3 ab	96.5 a-c	96.0 a	88.0 a-c
5	RU-21196-14D SC	0.393 fl oz	–					
	+ RU-21196-14G SC	0.16 fl oz	28	9.8 c-e	96.5 ab	99.0 a	88.5 a-e	76.8 a-j
6	RU-21196-14D SC	0.393 fl oz	–					
	+ RU-21196-14G SC	0.21 fl oz	28	9.3 c-e	95.0 ab	99.0 a	85.0 a-e	71.3 d-l
7	RU-21196-14D SC	0.393 fl oz	–					
	+ RU-21196-14H SC	0.47 fl oz	28	5.3 de	94.8 a-c	98.5 ab	78.3 a-g	84.5 a-e
8	RU-21196-14H SC	0.47 fl oz	28	4.2 de	97.8 ab	92.8 a-e	81.3 a-g	73.5 b-k
9	Mirage 2SC	1.0 fl oz	28[5]	7.5 c-e	98.5 a	94.8 a-e	75.8 b-g	75.3 a-j
10	Mirage 2SC	1.5 fl oz	28[5]	7.0 de	96.5 ab	96.0 a-c	83.5 a-f	80.3 a-g
11	Mirage 2SC	1.0 fl oz	–					
	+ Nortica 10W	12.9 oz	28[5]	15.8 b-e	98.5 a	98.5 ab	82.5 a-g	71.8 d-l
12	Mirage 2SC	1.5 fl oz	–					
	+ Nortica 10W	12.9 oz	28[5]	0.0 e	98.8 a	98.5 ab	87.3 a-e	89.3 ab
13	Velista 50WG	0.3 oz	14	25.8 b-d	98.0 ab	97.3 a-c	79.5 a-g	76.0 a-j
14	Heritage 50WG	0.2 oz	14	0.0 e	95.8 ab	91.5 a-e	81.0 a-g	83.8 a-e
15	A20964A WG	0.2 oz	14	0.0 e	98.3 ab	98.0 ab	92.0 a-c	86.5 a-d
16	Velista 50WG	0.3 oz	–					
	+ Heritage 50WG	0.2 oz	14	1.0 de	97.3 ab	98.8 ab	87.3 a-e	81.0 a-g
17	Velista 50WG	0.3 oz	–					
	+ A20964A WG	0.2 oz	14	7.3 de	93.8 a-d	97.5 a-c	87.0 a-e	82.5 a-f
18	Velista 50WG	0.5 oz	28	16.3 b-e	96.0 ab	95.3 a-c	78.3 a-g	63.8 h-n
19	A20964A WG	0.2 oz	28	5.8 de	97.0 ab	96.5 a-c	88.0 a-e	75.8 a-j
20	A20964A WG	0.4 oz	28	5.5 de	96.3 ab	98.0 ab	81.3 a-g	72.5 c-k

(Continued)

Table 1B. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[4]	Disease Severity Index[1,2] 29 Sept.	Density[3] 19 June	17 July	14 Aug.	11 Sept.
21	Heritage 50WG	0.4 oz	28	3.0 de	98.3 ab	90.5 a-e	74.5 c-g	81.5 a-g
22	Velista 50WG	0.5 oz	–					
	+ A20964A WG	0.2 oz	28	0.0 e	99.0 a	96.0 a-c	85.0 a-e	76.3 a-j
23	Velista 50WG	0.5 oz	–					
	+ A20964A WG	0.4 oz	28	0.0 e	96.5 ab	96.5 a-c	83.3 a-g	82.8 a-f
24	Velista 50WG	0.5 oz	–					
	+ Heritage 50WG	0.4 oz	28	9.6 c-e	99.3 a	98.8 ab	92.8 ab	83.8 a-e
25	A20581A SC	0.34 fl oz	28	7.0 de	97.8 ab	96.0 a-c	85.8 a-e	76.5 a-j
26	A20581A SC	0.47 fl oz	28	6.8 de	98.0 ab	98.5 ab	89.5 a-d	81.5 a-g
27	A20866A SC	0.26 fl oz	28	1.2 de	94.5 a-c	88.5 b-f	79.5 a-g	78.3 a-i
28	2014 SP Program #1	Syngenta	ALT-28[6]	5.8 de	96.3 ab	93.3 a-e	82.3 a-g	90.0 a
29	2014 SP Program #2	Syngenta	ALT-21[7]	20.5 b-e	97.5 ab	97.5 a-c	84.8 a-e	69.3 e-m
30	Headway 0.5ME	2.0 fl oz	14	0.0 e	99.0 a	94.8 a-e	88.3 a-e	79.5 a-h
31	Briskway 2.7SC	0.3 fl oz	14	0.0 e	98.3 ab	96.5 a-c	81.8 a-g	84.5 a-e
32	2014 SP Program #3	Plant-food	14[8]	32.6 bc	88.0 d	84.5 e-g	71.5 e-g	55.0 m-o
33	2014 SP Program #4	Plant-food	14[9]	24.0 b-e	76.0 e	74.5 g-h	53.3 hi	52.8 no
34	Xzemplar 2.5SC	0.21 fl oz	21	16.0 b-e	95.0 ab	95.0 a-d	79.0 a-g	56.3 l-o
35	Xzemplar 2.5SC	0.26 fl oz	28	11.0 c-e	88.8 cd	91.0 a-e	79.0 a-g	65.8 g-n
36	Lexicon 4.1SC	0.47 fl oz	28	13.3 c-e	95.8 ab	94.5 a-e	79.5 a-g	61.3 j-o
37	ARY-0534-002 SC	0.33 fl oz	21	0.0 e	96.5 ab	96.5 a-c	86.3 a-e	75.0 a-j
38	Disarm T SC	0.66 fl oz	21	11.3 c-e	99.0 a	96.0 a-c	81.0 a-g	62.3 i-o
39	Disarm M 3.9SC	1.0 fl oz	21	7.5 c-e	98.3 ab	84.8 d-g	73.0 d-g	63.8 h-n
40	Disarm 480SC	0.36 fl oz	21	20.1 b-e	96.0 ab	87.3 c-f	75.3 b-g	67.3 f-n
41	2014 SP Program #5	Harrells	28[10]	14.9 b-e	99.3 a	94.3 a-e	85.0 a-e	71.5 d-l
42	2014 SP Program #6	Harrells	14[11]	1.8 de	99.8 a	99.5 a	95.3 a	82.8 a-f
43	Tourney 50WG	0.37 oz	14	0.0 e	99.5 a	98.3 ab	91.5 a-c	90.8 a
44	Banner Maxx 1.3ME	2.0 fl oz	14	19.5 b-e	96.8 ab	99.8 a	90.3 a-d	69.8 e-m
45	Banner Maxx 1.3ME	4.0 fl oz	28	0.7 de	98.3 ab	99.8 a	83.0 a-g	82.5 a-f

(Continued)

Table 1B. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[4]	Disease Severity Index[1,2] 29 Sept.	Density[3] 19 June	17 July	14 Aug.	11 Sept.
46	Daconil Ultrex 82.5WG	3.2 oz	14	39.5 ab	98.3 ab	79.3 f-h	45.0 i	47.5 o
47	3336 4F	4.0 fl oz	14	17.9 b-e	96.5 ab	88.5 b-f	85.8 a-e	58.0 k-o
48	Ammonium Sulfate	0.2 lb	CUR-Once[12]	14.8 b-e	93.8 a-d	90.3 a-e	65.5 gh	61.3 j-o
49	Ammonium Sulfate	0.2 lb	14	18.5 b-e	95.0 ab	90.0 a-e	82.0 a-g	68.8 e-n
50	Ammonium Sulfate	0.2 lb	–					
	+ Banner Maxx 1.3ME	2.0 fl oz	14	0.0 e	97.3 ab	95.0 a-d	85.3 a-e	83.8 a-e
51	Untreated Check	–	–	64.0 a	92.3 b-d	73.8 he	65.8 f-h	53.0 no
			INT[13]	DAT[14]	DAT	DAT	DAT	DAT
			14	60	14	14	14	42
			21	67	7	14	21	49
			28	74	28	28	28	56

[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). All fungicides were applied in 4.0 gal H_2O per 1000 sq ft with a CO_2 compressed air sprayer, T-Jet nozzle 8003E, at 30 psi.

[2] Disease severity index = patch diameter x disease intensity. Disease intensity was rated on a 0 to 3 scale, where 0 = no visual foliar necrosis, 1 = 1 to 33% necrotic foliage, 2 = 34 to 66% necrotic foliage, and 3 = 67 to 100% necrotic foliage. Patch diameter was recorded as the mean of two perpendicular measurements per infection center. Three locations were inoculated per 3 x 9 ft replicate plot with *Magnaporthe poae* isolate OAK A-5 on 15 May 2004. Disease severity values were averaged for each plot.

[3] Percent area with green cover per plot.

[4] Fungicides were applied on 22 May (all treatments; except treatments 32 and 33), 28 May (treatments 32 and 33), 5 June (14-day treatment), 12 June (21-day treatment), 19 June (14- and 28-day treatments), 3 July (14- and 21-day treatments), 17 July (14- and 28-day treatments), 24 July (21-day treatment), and 31 July (14-day treatment).

[5] Treatments 9 to 12 were irrigated with 0.5 gal of H_2O per plot immediately following application.

[6] ALT = alteration treatment, where treatment 28 (2014 Syngenta Summer Patch Program #1) consisted of Headway 0.8ME (3.0 fl oz) applied on 22 May, and Briskway 2.7SC (0.725 fl oz) on 19 June and 17 July.

(Continued)

Table 1B. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

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[7] ALT = alteration treatment, where treatment 29 (2014 Syngenta Summer Patch Program #2) consisted of Briskway 2.7SC (0.6 fl oz) applied on 22 May and 3 July, and Velista 50WG (0.5 oz) on 12 June and 24 July.

[8] Treatment 32, 2014 SP Plant-food Program #3, consisted of 7-0-7 LC (12.0 fl oz) + Mn 5% LC (4.0 fl oz) + FloThru LC (4.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[9] Treatment 33, 2014 SP Plant-food Program #4, consisted of 7-0-7 LC (15.0 fl oz) + Mn 5% LC (8.0 fl oz) + FloThru LC (6.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[10] Treatment 41 (2014 Harrells Summer Patch Program #5) consisted of Lexicon Intrinsic 4.2SC (0.47 fl oz) + Earth Maxx LC (4.0 fl oz) + 4-0-0 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 28 days.

[11] Treatment 42 (2014 Harrells Summer Patch Program #6) consisted of Briskway 2.7SC (0.3 fl oz) + Earth Maxx LC (2.0 fl oz) + 4-0-0 LC (3.0 fl oz) + N30 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 14 days.

[12] Treatment 48 was applied once upon symptom expression on 24 July.

[13] INT = Spray interval in days.

[14] DAT = Days after the last treatment.

Table 1C. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2014.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Turf Quality[1,2] 19 June	17 July	14 Aug.	11 Sept.
1	RU-21196-14D SC	0.197 fl oz	28	8.1 ab	7.3 b-g	7.3 a-h	6.1 b-i
2	RU-21196-14D SC	0.393 fl oz	28	7.9 a-c	8.4 a-e	7.2 a-h	6.1 b-j
3	RU-21196-14D SC	0.786 fl oz	28	8.0 ab	8.2 a-f	7.3 a-g	6.7 b-h
4	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14F LC	2.3 fl oz	28	7.9 a-c	7.5 a-g	8.2 ab	6.9 a-e
5	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14G SC	0.16 fl oz	28	7.7 a-d	7.9 a-g	7.6 a-d	6.0 d-j
6	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14G SC	0.21 fl oz	28	7.6 a-d	7.4 a-g	7.5 a-e	6.3 b-i
7	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14H SC	0.47 fl oz	28	7.9 a-c	7.9 a-f	5.8 g-m	6.7 b-h
8	RU-21196-14H SC	0.47 fl oz	28	8.1 ab	7.0 c-h	6.2 d-m	6.4 b-i
9	Mirage 2SC	1.0 fl oz	28[4]	8.7 a	7.1 b-h	5.9 e-m	6.1 c-j
10	Mirage 2SC	1.5 fl oz	28[4]	8.2 ab	7.4 a-g	6.3 d-m	6.2 b-i
11	Mirage 2SC	1.0 fl oz	–				
	+ Nortica 10W	12.9 oz	28[4]	8.5 a	8.4 a-e	6.6 b-l	6.2 b-i
12	Mirage 2SC	1.5 fl oz	–				
	+ Nortica 10W	12.9 oz	28[4]	8.2 ab	8.4 a-e	6.9 a-j	7.2 a-d
13	Velista 50WG	0.3 oz	14	8.1 ab	6.9 d-h	6.0 e-m	5.5 e-k
14	Heritage 50WG	0.2 oz	14	7.7 a-d	7.1 b-h	5.5 j-m	6.7 b-h
15	A20964A WG	0.2 oz	14	8.1 ab	7.7 a-g	7.3 a-g	8.5 a
16	Velista 50WG	0.3 oz	–				
	+ Heritage 50WG	0.2 oz	14	8.2 ab	8.4 a-e	7.2 a-i	7.3 a-d
17	Velista 50WG	0.3 oz	–				
	+ A20964A WG	0.2 oz	14	7.9 a-c	7.0 c-h	7.4 a-g	7.0 a-e
18	Velista 50WG	0.5 oz	28	8.2 ab	7.5 a-g	6.4 c-l	5.3 f-l
19	A20964A WG	0.2 oz	28	7.6 a-d	8.2 a-f	7.5 a-f	6.3 b-i
20	A20964A WG	0.4 oz	28	8.5 a	8.5 a-d	7.6 a-d	6.6 b-h
21	Heritage 50WG	0.4 oz	28	8.5 a	6.6 f-h	6.2 d-m	6.6 b-h

(Continued)

Table 1C. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Turf Quality[1,2] 19 June	17 July	14 Aug.	11 Sept.
22	Velista 50WG	0.5 oz	–				
	+ A20964A WG	0.2 oz	28	8.0 ab	7.3 b-h	6.9 a-j	6.9 b-f
23	Velista 50WG	0.5 oz	–				
	+ A20964A WG	0.4 oz	28	7.9 a-c	7.2 b-h	7.1 a-i	6.9 b-f
24	Velista 50WG	0.5 oz	–				
	+ Heritage 50WG	0.4 oz	28	8.0 a-c	8.6 ab	7.6 a-d	6.5 b-i
25	A20581A SC	0.34 fl oz	28	7.3 a-d	7.6 a-g	6.7 b-k	6.7 b-h
26	A20581A SC	0.47 fl oz	28	8.6 a	8.0 a-f	7.0 a-j	6.8 b-g
27	A20866A SC	0.26 fl oz	28	7.3 a-d	6.7 f-h	5.6 i-m	6.4 b-i
28	2014 SP Program #1	Syngenta	ALT-28[5]	7.6 a-d	7.0 c-h	7.0 a-j	7.6 a-c
29	2014 SP Program #2	Syngenta	ALT-21[6]	8.0 a-c	7.3 b-h	6.0 e-m	5.3 g-l
30	Headway 0.5ME	2.0 fl oz	14	8.4 a	7.6 a-g	7.1 a-j	6.6 b-h
31	Briskway 2.7SC	0.3 fl oz	14	8.1 ab	7.4 a-g	6.3 d-m	7.2 a-d
32	2014 SP Program #3	Plant-food	14[7]	6.6 cd	4.7 ij	5.0 l-n	3.8 lm
33	2014 SP Program #4	Plant-food	14[8]	6.4 d	4.3 j	3.9 n	5.2 h-l
34	Xzemplar 2.5SC	0.21 fl oz	21	7.4 a-d	6.7 f-h	5.7 h-m	5.0 i-l
35	Xzemplar 2.5SC	0.26 fl oz	28	6.9 b-d	6.9 e-h	5.2 k-n	5.9 d-k
36	Lexicon 4.1SC	0.47 fl oz	28	8.4 a	7.4 a-g	6.5 c-l	5.0 i-l
37	ARY-0534-002 SC	0.33 fl oz	21	7.5 a-d	7.4 a-g	7.1 a-i	7.1 a-d
38	Disarm T SC	0.66 fl oz	21	7.9 a-c	7.6 a-g	7.1 a-j	6.4 b-i
39	Disarm M 3.9SC	1.0 fl oz	21	8.2 ab	5.7 h-j	5.0 l-n	5.3 g-l
40	Disarm 480SC	0.36 fl oz	21	7.3 a-d	6.3 g-i	5.9 g-m	5.0 i-l
41	2014 SP Program #5	Harrells	28[9]	8.6 a	7.6 a-g	6.2 d-m	6.0 d-j
42	2014 SP Program #6	Harrells	14[10]	8.7 a	9.0 a	8.3 a	7.3 a-d
43	Tourney 50WG	0.37 oz	14	8.2 ab	8.6 a-c	8.0 a-c	7.7 ab
44	Banner Maxx 1.3ME	2.0 fl oz	14	7.7 a-d	7.9 a-f	7.2 a-i	5.4 e-k
45	Banner Maxx 1.3ME	4.0 fl oz	28	7.6 a-d	8.4 a-e	7.0 a-j	6.9 a-e
46	Daconil Ultrex 82.5WG	3.2 oz	14	7.9 a-c	4.8 ij	2.3 o	3.1 lm
47	3336 4F	4.0 fl oz	14	8.1 ab	7.8 a-g	5.9 f-m	4.6 j-m

(Continued)

Table 1C. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Turf Quality[1,2] 19 June	17 July	14 Aug.	11 Sept.
48	Ammonium Sulfate	0.2 lb	CUR-Once[11]	7.7 a-d	7.0 c-h	4.7 mn	4.4 j-m
49	Ammonium Sulfate	0.2 lb	14	7.6 a-d	6.9 e-h	6.4 c-l	5.5 e-k
50	Ammonium Sulfate	0.2 lb	–				
	+ Banner Maxx 1.3ME	2.0 fl oz	14	8.2 ab	7.2 b-h	6.1 d-m	6.0 c-j
51	Untreated Check	–	–	6.9 b-d	4.4 j	3.6 no	3.8 lm
			INT[12]	DAT[13]	DAT	DAT	DAT
			14	14	14	14	42
			21	7	14	21	49
			28	28	28	28	56

[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). All fungicides were applied in 4.0 gal H_2O per 1000 sq ft with a CO_2 compressed air sprayer, T-Jet nozzle 8003E, at 30 psi.

[2] Turf quality on a scale of 1 to 9, where 9 = best turf quality and 5 = commercially acceptable quality.

[3] Fungicides were applied on 22 May (all treatments; except treatments 32 and 33), 28 May (treatments 32 and 33), 5 June (14-day treatment), 12 June (21-day treatment), 19 June (14- and 28-day treatments), 3 July (14- and 21-day treatments), 17 July (14- and 28-day treatments), 24 July (21-day treatment), and 31 July (14-day treatment).

[4] Treatments 9 to 12 were irrigated with 0.5 gal of H_2O per plot immediately following application.

[5] ALT = alteration treatment, where treatment 28 (2014 Syngenta Summer Patch Program #1) consisted of Headway 0.8ME (3.0 fl oz) applied on 22 May, and Briskway 2.7SC (0.725 fl oz) on 19 June and 17 July.

[6] ALT = alteration treatment, where treatment 29 (2014 Syngenta Summer Patch Program #2) consisted of Briskway 2.7SC (0.6 fl oz) applied on 22 May and 3 July, and Velista 50WG (0.5 oz) on 12 June and 24 July.

[7] Treatment 32, 2014 SP Plant-food Program #3, consisted of 7-0-7 LC (12.0 fl oz) + Mn 5% LC (4.0 fl oz) + FloThru LC (4.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[8] Treatment 33, 2014 SP Plant-food Program #4, consisted of 7-0-7 LC (15.0 fl oz) + Mn 5% LC (8.0 fl oz) + FloThru LC (6.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[9] Treatment 41 (2014 Harrells Summer Patch Program #5) consisted of Lexicon Intrinsic 4.2SC (0.47 fl oz) + Earth Maxx LC (4.0 fl oz) + 4-0-0 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 28 days.

(Continued)

Table 1C. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

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[10] Treatment 42 (2014 Harrells Summer Patch Program #6) consisted of Briskway 2.7SC (0.3 fl oz) + Earth Maxx LC (2.0 fl oz) + 4-0-0 LC (3.0 fl oz) + N30 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 14 days.
[11] Treatment 48 was applied once upon symptom expression on 24 July.
[12] INT = Spray interval in days.
[13] DAT = Days after the last treatment.

Table 1D. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2014.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Color[1,2] 19 June	17 July	14 Aug.	11 Sept.
1	RU-21196-14D SC	0.197 fl oz	28	5.0 a	5.0 c	5.0 f-h	5.0 ef
2	RU-21196-14D SC	0.393 fl oz	28	5.5 a	5.0 c	5.0 f-h	5.0 ef
3	RU-21196-14D SC	0.786 fl oz	28	5.5 a	5.1 bc	5.1 e-h	5.1 d-f
4	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14F LC	2.3 fl oz	28	5.0 a	5.4 bc	5.0 f-h	5.1 c-f
5	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14G SC	0.16 fl oz	28	5.1 a	5.3 bc	5.0 f-h	5.0 ef
6	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14G SC	0.21 fl oz	28	5.0 a	5.3 bc	5.0 f-h	4.9 f
7	RU-21196-14D SC	0.393 fl oz	–				
	+ RU-21196-14H SC	0.47 fl oz	28	5.1 a	5.0 c	4.8 h	5.0 ef
8	RU-21196-14H SC	0.47 fl oz	28	5.0 a	5.0 c	5.3 d-g	5.0 ef
9	Mirage 2SC	1.0 fl oz	28[4]	5.0 a	5.1 bc	5.0 f-h	5.1 c-f
10	Mirage 2SC	1.5 fl oz	28[4]	5.0 a	5.3 bc	5.0 f-h	5.1 c-f
11	Mirage 2SC	1.0 fl oz	–				
	+ Nortica 10W	12.9 oz	28[4]	5.3 a	5.3 bc	5.5 c-e	5.1 d-f
12	Mirage 2SC	1.5 fl oz	–				
	+ Nortica 10W	12.9 oz	28[4]	5.3 a	5.3 bc	5.5 c-e	5.0 ef
13	Velista 50WG	0.3 oz	14	5.0 a	5.1 bc	5.1 e-h	5.0 ef
14	Heritage 50WG	0.2 oz	14	5.0 a	5.1 bc	5.1 e-h	5.3 b-e
15	A20964A WG	0.2 oz	14	5.0 a	5.0 c	5.1 e-h	5.0 ef
16	Velista 50WG	0.3 oz	–				
	+ Heritage 50WG	0.2 oz	14	5.3 a	5.0 c	5.3 d-g	5.0 ef
17	Velista 50WG	0.3 oz	–				
	+ A20964A WG	0.2 oz	14	5.3 a	5.0 c	5.1 e-h	5.0 ef
18	Velista 50WG	0.5 oz	28	5.4 a	5.1 bc	5.3 d-g	5.3 b-e
19	A20964A WG	0.2 oz	28	5.0 a	5.1 bc	5.3 d-g	5.2 c-e
20	A20964A WG	0.4 oz	28	5.3 a	5.1 bc	5.0 f-h	5.0 ef
21	Heritage 50WG	0.4 oz	28	5.1 a	5.3 bc	5.1 e-h	5.0 ef

(Continued)

Table 1D. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Color[1,2] 19 June	17 July	14 Aug.	11 Sept.
22	Velista 50WG	0.5 oz	–				
	+ A20964A WG	0.2 oz	28	5.4 a	5.0 c	5.0 f-h	5.0 ef
23	Velista 50WG	0.5 oz	–				
	+ A20964A WG	0.4 oz	28	5.3 a	5.0 c	5.0 f-h	5.0 ef
24	Velista 50WG	0.5 oz	–				
	+ Heritage 50WG	0.4 oz	28	5.4 a	5.0 c	5.1 e-h	5.0 ef
25	A20581A SC	0.34 fl oz	28	5.0 a	5.0 c	4.9 gh	5.0 ef
26	A20581A SC	0.47 fl oz	28	5.3 a	5.1 bc	4.9 gh	5.0 ef
27	A20866A SC	0.26 fl oz	28	5.1 a	5.0 c	5.0 f-h	5.1 c-f
28	2014 SP Program #1	Syngenta	ALT-28[5]	5.1 a	5.3 bc	5.0 f-h	5.0 ef
29	2014 SP Program #2	Syngenta	ALT-21[6]	5.4 a	5.1 bc	5.0 f-h	5.0 ef
30	Headway 0.5ME	2.0 fl oz	14	5.0 a	5.3 bc	5.1 e-h	5.0 ef
31	Briskway 2.7SC	0.3 fl oz	14	5.1 a	5.1 bc	5.0 f-h	5.1 d-f
32	2014 SP Program #3	Plant-food	14[7]	5.3 a	5.3 bc	5.9 bc	5.5 ab
33	2014 SP Program #4	Plant-food	14[8]	5.0 a	5.0 c	6.0 ab	5.7 a
34	Xzemplar 2.5SC	0.21 fl oz	21	5.0 a	5.0 c	5.0 f-h	5.0 ef
35	Xzemplar 2.5SC	0.26 fl oz	28	5.3 a	5.0 c	4.9 gh	5.3 b-e
36	Lexicon 4.1SC	0.47 fl oz	28	5.3 a	5.0 c	5.0 f-h	5.0 ef
37	ARY-0534-002 SC	0.33 fl oz	21	5.1 a	5.0 c	5.0 f-h	5.0 ef
38	Disarm T SC	0.66 fl oz	21	5.1 a	5.1 bc	5.1 e-h	5.1 ef
39	Disarm M 3.9SC	1.0 fl oz	21	5.1 a	5.1 bc	5.1 e-h	5.4 b-d
40	Disarm 480SC	0.36 fl oz	21	5.3 a	5.3 bc	5.1 e-h	5.0 ef
41	2014 SP Program #5	Harrells	28[9]	5.4 a	5.6 b	5.4 d-f	5.1 d-f
42	2014 SP Program #6	Harrells	14[10]	5.8 a	6.4 a	6.4 a	5.4 bc
43	Tourney 50WG	0.37 oz	14	5.1 a	5.4 bc	5.0 f-h	5.0 ef
44	Banner Maxx 1.3ME	2.0 fl oz	14	5.0 a	5.0 c	5.0 f-h	5.3 b-e
45	Banner Maxx 1.3ME	4.0 fl oz	28	5.0 a	5.0 c	5.0 f-h	5.1 ef
46	Daconil Ultrex 82.5WG	3.2 oz	14	5.3 a	5.3 bc	5.6 b-d	5.3 b-e
47	3336 4F	4.0 fl oz	14	5.4 a	5.1 bc	5.0 f-h	5.1 c-f

(Continued)

Table 1D. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Color[1,2] 19 June	17 July	14 Aug.	11 Sept.
48	Ammonium Sulfate	0.2 lb	CUR-Once[11]	5.3 a	5.1 bc	5.3 d-g	5.0 ef
49	Ammonium Sulfate	0.2 lb	14	5.4 a	5.5 bc	5.3 d-g	5.1 c-f
50	Ammonium Sulfate	0.2 lb	–				
	+ Banner Maxx 1.3ME	2.0 fl oz	14	5.3 a	5.0 c	5.0 f-h	5.0 ef
51	Untreated Check	–	–	5.0 a	5.0 c	4.9 gh	5.0 ef
			INT[12]	DAT[13]	DAT	DAT	DAT
			14	14	14	14	42
			21	7	14	21	49
			28	28	28	28	56

[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). All fungicides were applied in 4.0 gal H_2O per 1000 sq ft with a CO_2 compressed air sprayer, T-Jet nozzle 8003E, at 30 psi.

[2] Color of foliage on a 1 to 10 scale, where 5 = color of healthy untreated turf, less than 5 = progressively more chlorotic or necrotic turf, and greater than 5 = progressively darker green turf.

[3] Fungicides were applied on 22 May (all treatments; except treatments 32 and 33), 28 May (treatments 32 and 33), 5 June (14-day treatment), 12 June (21-day treatment), 19 June (14- and 28-day treatments), 3 July (14- and 21-day treatments), 17 July (14- and 28-day treatments), 24 July (21-day treatment), and 31 July (14-day treatment).

[4] Treatments 9 to 12 were irrigated with 0.5 gal of H_2O per plot immediately following application.

[5] ALT = alteration treatment, where treatment 28 (2014 Syngenta Summer Patch Program #1) consisted of Headway 0.8ME (3.0 fl oz) applied on 22 May, and Briskway 2.7SC (0.725 fl oz) on 19 June and 17 July.

[6] ALT = alteration treatment, where treatment 29 (2014 Syngenta Summer Patch Program #2) consisted of Briskway 2.7SC (0.6 fl oz) applied on 22 May and 3 July, and Velista 50WG (0.5 oz) on 12 June and 24 July.

[7] Treatment 32, 2014 SP Plant-food Program #3, consisted of 7-0-7 LC (12.0 fl oz) + Mn 5% LC (4.0 fl oz) + FloThru LC (4.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

[8] Treatment 33, 2014 SP Plant-food Program #4, consisted of 7-0-7 LC (15.0 fl oz) + Mn 5% LC (8.0 fl oz) + FloThru LC (6.0 fl oz) + Omega LC (0.7 fl oz) + Impulse GT LC (3.0 fl oz) + 0-0-29 LC (3.0 fl oz) + Mg Nitrate LC (4.0 fl oz) applied every 14 days.

(Continued)

Table 1D. Suppressing summer patch on Kentucky bluegrass, 2014 (continued).

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[9] Treatment 41 (2014 Harrells Summer Patch Program #5) consisted of Lexicon Intrinsic 4.2SC (0.47 fl oz) + Earth Maxx LC (4.0 fl oz) + 4-0-0 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 28 days.
[10] Treatment 42 (2014 Harrells Summer Patch Program #6) consisted of Briskway 2.7SC (0.3 fl oz) + Earth Maxx LC (2.0 fl oz) + 4-0-0 LC (3.0 fl oz) + N30 LC (4.0 fl oz) + PAR SG LC (0.37 fl oz) applied every 14 days.
[11] Treatment 48 was applied once upon symptom expression on 24 July.
[12] INT = Spray interval in days.
[13] DAT = Days after the last treatment.