

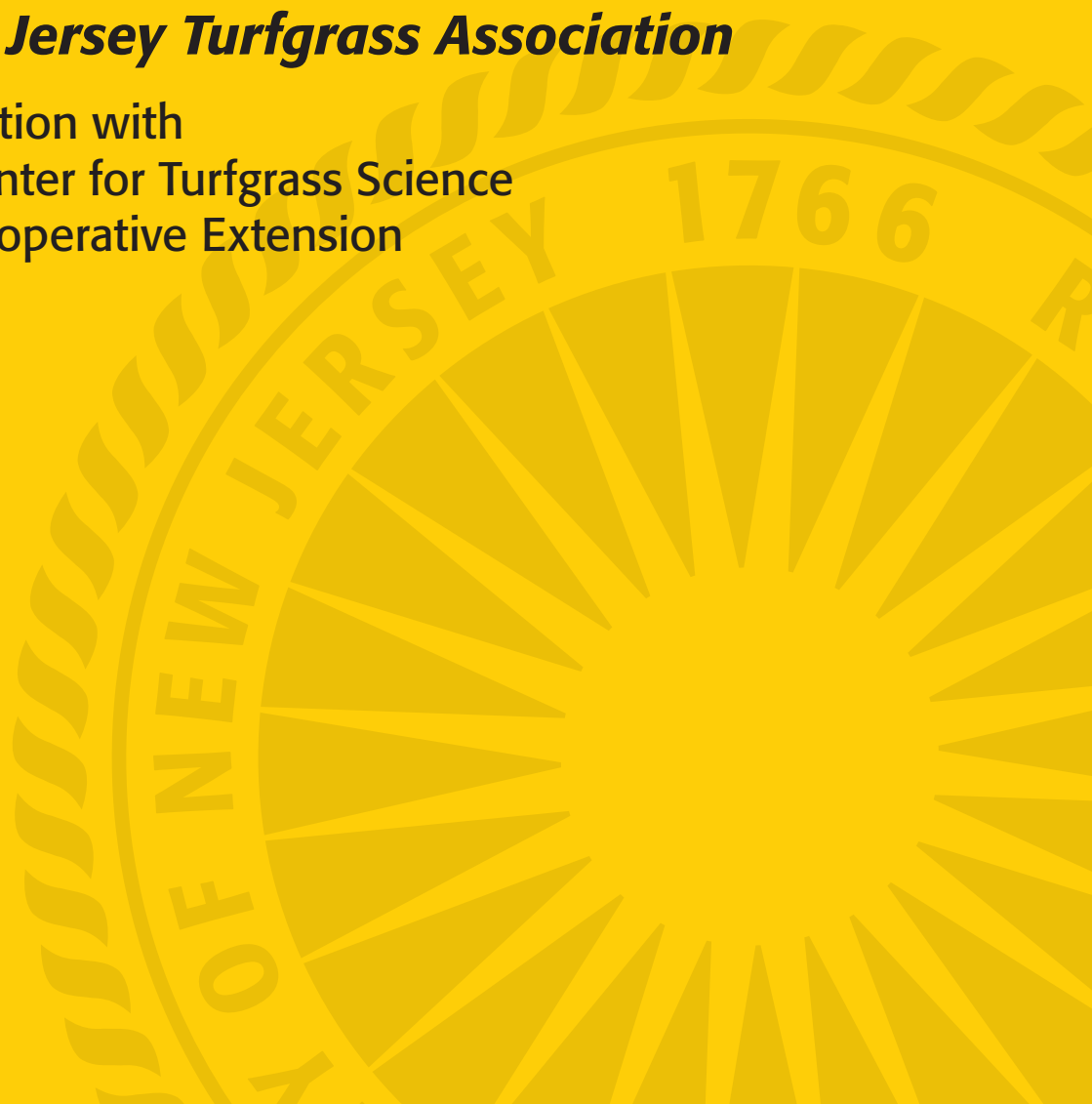
RUTGERS

New Jersey Agricultural
Experiment Station

2012 Turfgrass Proceedings

The New Jersey Turfgrass Association

In Cooperation with
Rutgers Center for Turfgrass Science
Rutgers Cooperative Extension



2012 RUTGERS TURFGRASS PROCEEDINGS

of the

GREEN EXPO Turf and Landscape Conference

December 4-6, 2012

Trump Taj Mahal

Atlantic City, New Jersey

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 2012 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.

Special thanks are given to those who have submitted papers for this proceedings, to the New Jersey Turfgrass Association for financial assistance, and to Barbara Fitzgerald, Anne Diglio, and Ann Jenkins for administrative and secretarial support.

Dr. Ann Brooks Gould, Editor
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SUPPRESSING SUMMER PATCH WITH SELECTED FUNGICIDES ON KENTUCKY BLUEGRASS, 2012

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Fungicides were evaluated in 2012 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 6.7. 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.

Fertilizer was applied as 16-4-8 nitrogen (N) (0.4 lb N per 1000 ft²) on 28 March and (0.67 lb N per 1000 ft²) on 6 July and 27 September. Dimension 2EW (0.25 fl oz per 1000 ft²) was sprayed on 17 April for pre-emergence weed control. Broadleaf weeds were controlled with Lontrel 3LC (8.0 fl oz per acre) and Banvel 4LC (8.0 fl oz per acre) on 26 May. Insect pests were suppressed with Merit 75WSP (0.17 oz per 1000 ft²) on 15 June. Yellow nutsedge was controlled with Manage 75WG (1.0 oz per acre) on 18 June. Emerald 70WG (0.18 oz per 1000 ft²) was applied to the entire test area on 20 June to control dollar spot (caused by *Sclerotinia homoeocarpa*).

Fungicides were applied in water equivalent to 4 gal per 1000 ft² with a CO₂ powered sprayer at 30 psi using TeeJet 8003VS flat fan 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 appropriate intervals as indicated in Tables 1A to 1C. Turf area exhibiting foliar symptoms of summer patch was assessed as a disease severity index (DSI) on 31 July, 10, 20, and 31 August, 10 and 19 September, and 3 October. 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. Turf quality was rated on 18 June, 14 July, 11 August, and 17 September using a 1 to 9 scale, where 9 = best turf quality and 5 = acceptable quality. Color of foliage was visually estimated on 18 June, 14 July, and 11 August 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, and 5 = very dark green color. Phytotoxicity was not observed in this study. 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 20 July but did not become uniformly distributed throughout the study area until 31 July (Table 1A). The epidemic peaked at a DSI of 60 for untreated turf (trt 41) on 10 September, which was considered a moderate to severe summer patch infestation. A DSI of less than 15 was considered an acceptable level of disease control. The following products in this study, most of which contained a DMI and/or a QoI fungicide,

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provided season long control throughout the evaluation period (22 May to 3 October, 57 to 78 days after the final treatment application; Tables 1A and 1B): Tourney 50WG (trt 1), Xzemplar 2.5SC @ 0.262 fl oz every 28 days (trt 5), Velista 50WDG + Heritage 50WG (trt 14), Pillar 0.8G (trt 15), Headway G (trt 16), Heritage 50WG (trt 29), Torque 3.6SC (trt 38, 39), and 3336 4F +Torque 3.6SC (trt 40). Other treatments provided good to excellent disease control throughout the application period (22 May to 20 August; Tables 1A) [i.e., S-2200 4SC + Tourney 50WG (trt 3), Lexicon Intrinsic 4.17SC @ 0.34 fl oz (trt 6), Triton Flo 3.1SC (trt 10), Velista 50WDG @ 0.5 oz (trt 12), NB37904 1.8SC @ 0.50 fl oz (trt 17), 0.66 fl oz (trt 18), 0.75 fl oz (trt 19) every 14 days, NB37904 1.8SC @ 0.75 fl oz every 21 days (trt 20), NB38205 3.3SC @ 0.40 fl oz (trt 22), NB37908 28WP (trt 24), NB38205 3.3SC + NB 37908 28WP (trts 27, 28), Banner MAXX 1.3ME (trt 30), QP Enclave 5.3F + Foursome 100SL (trts 31, 32), and Plant Food 2012 Summer Patch Programs # 2 (trt 37)]. It is interesting to note that Velista 50WDG + Daconil Ultrex 82.5WDG (trt 13) enhanced disease severity on several evaluation dates (31 August and 19 September) compared to Velista 50WDG alone at the same 0.3 oz rate (trt 11) and untreated turf (trt 41).

This was apparently due to the addition of Daconil Ultrex 82.5WDG, which has been shown to intensify summer patch severity when applied every 14 days throughout the summer months, to the tank mixture with Velista 50WDG.

Turf quality was acceptable (greater or equal to 5.0) for most entries in this study. In general, turf treated with products that provided poor summer patch control, e.g., Segway 3.3SC (trt 25) and K1 LC (trt), exhibited poor turf quality towards the end of the evaluation period (Table 1B).

Several treatments resulted in visually darker green foliage on at least 50% of the evaluation dates [i.e., Reserve 4.8SC (trt 9), Triton Flo 3.1SC (trt 10), Headway G (trt 16), QP Enclave 5.3F + Foursome 100SL (trts 31, 32), QP Enclave 5.3F + QP Fosetyl-Al 80WG + Foursome 100SL (trts 33, 34), K1 LC (trt 35), and Plant Food 2012 Summer Patch Programs #1 (trt 36) and # 2 (trt 37)], presumably because they contained either a pigment, fertilizer, and/or a plant growth regulator (Table 1C). No phytotoxicity was observed in this study.

Table 1A. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2012.

Treatment	Rate per 1000 sq ft	Application Schedule (days) ³	Disease Severity Index ^{1,2}					
			31 July	10 Aug.	20 Aug.	31 Aug.	10 Sept.	19 Sept.
1 Tourney 50WG.....	0.37 oz	14 ⁴	1.4 f-h	0.0 c	0.0 d	2.4 hi	2.5 ij	1.8 j
2 S-2200 4SC	0.35 fl oz	14 ⁴	8.3 b-h	12.6 a-c	25.7 a-d	35.4 b-i	41.6 b-h	42.8 c-h
3 S-2200 4SC	0.25 fl oz	—						
+ Tourney 50WG	0.28 oz	14 ⁴	2.8 e-h	5.7 a-c	14.7 b-d	23.5 d-i	23.9 c-j	44.0 c-h
4 Xzemplar 2.5SC.....	0.21 fl oz	28	9.1 b-h	15.1 a-c	17.0 b-d	33.7 b-i	34.8 c-j	53.2 b-f
5 Xzemplar 2.5SC.....	0.262 fl oz	28	0.0 h	0.0 c	0.0 d	5.3 g-i	13.5 f-j	14.3 g-j
6 Lexicon Intrinsic 4.17SC	0.34 fl oz	28	11.1 b-h	8.3 a-c	9.6 cd	16.3 f-i	23.3 c-j	29.8 d-j
7 Lexicon Intrinsic 4.17SC	0.472 fl oz	28	9.3 b-h	14.2 a-c	17.2 b-d	20.8 e-i	22.8 d-j	23.2 e-j
8 Honor Intrinsic 28WG	1.1 oz	28	7.6 c-h	14.1 a-c	21.6 a-d	34.0 b-i	48.8 b-f	40.8 c-j
9 Reserve 4.8SC.....	3.0 fl oz	28	25.3 a-b	38.6 a-b	46.8 ab	65.3 a-c	74.3 ab	75.6 a-c
10 Triton Flo 3.1SC.....	0.75 fl oz	28	7.8 c-h	8.0 a-c	12.8 b-d	28.0 d-i	37.8 b-j	40.9 c-i
11 Velista 50WDG.....	0.3 oz	14	4.5 c-h	4.8 a-c	15.3 b-d	15.3 f-i	21.8 b-j	38.6 c-j
12 Velista 50WDG	0.5 oz	14	4.3 c-h	5.3 a-c	13.3 b-d	21.6 d-i	24.8 c-j	39.4 c-i
13 Velista 50WDG	0.3 oz	—						
+ Daconil Ultrex 82.5WDG.....	3.25 oz	14	18.8 a-f	40.6 a	51.9 a	85.1 a	91.8 a	93.3 a
14 Velista 50WDG.....	0.3 oz	—						
+ Heritage 50WG	0.2 oz	14	0.0 h	0.0 c	0.0 d	0.0 i	0.0 j	12.7 g-j
15 Pillar 0.8G	48.0 oz	28 ⁵	1.6 f-h	0.0 c	2.7 d	6.3 g-i	9.7 g-j	15.5 g-j
16 Headway G	60.0 oz	28 ⁵	1.9 f-h	0.0 c	2.0 d	1.8 hi	3.3 h-j	4.5 ij
17 NB37904 1.8SC.....	0.50 fl oz	14	3.9 c-h	2.4 b-c	4.7 c-d	14.3 f-i	18.4 e-j	22.9 e-j
18 NB37904 1.8SC.....	0.66 fl oz	14	3.4 d-h	5.3 a-c	10.8 c-d	19.3 e-i	22.4 d-j	36.0 d-j
19 NB37904 1.8SC.....	0.75 fl oz	14	5.8 c-h	5.3 a-c	11.5 c-d	19.5 e-i	23.3 c-j	33.2 d-j
20 NB37904 1.8SC.....	0.75 fl oz	21	4.0 c-h	6.1 a-c	9.1 c-d	23.7 d-i	35.2 c-j	35.9 d-j
21 NB37904 1.8SC.....	1.0 fl oz	21	8.5 b-h	16.7 a-c	20.9 a-d	31.3 b-i	30.4 c-j	19.6 f-j
22 NB38205 3.3SC	0.40 fl oz	14	7.6 c-h	5.1 a-c	14.8 b-d	31.8 b-i	31.9 c-j	34.7 d-j
23 NB38205 3.3SC.....	0.50 fl oz	14	7.7 c-h	15.8 a-c	23.0 a-d	29.6 c-i	45.0 b-g	40.0 c-i
24 NB37908 28WP	1.1 oz	14	1.8 f-h	2.8 b-c	12.4 b-d	24.4 d-i	31.4 c-j	34.5 d-j
25 Segway 3.3SC	0.45 fl oz	14	20.6 a-d	30.8 a-c	39.1 a-c	52.7 a-e	75.5 ab	65.8 a-d
26 Affirm 11.3WG.....	0.87 oz	14	8.0 b-h	16.9 a-c	23.1 a-d	36.1 b-h	47.0 b-g	45.1 c-g

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(Continued)

Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) ³	Disease Severity Index ^{1,2}					
			31 July	10 Aug.	20 Aug.	31 Aug.	10 Sept.	19 Sept.
27 NB38205 3.3SC.....0.40 fl oz	—	—						
+ NB 37908 28WP..... 1.1 oz	14	14	1.3 f-h	2.9 bc	11.5 cd	34.1 b-i	44.4 b-g	35.2 d-j
28 NB 38205 3.3SC.....0.50 fl oz	—	—						
+ NB 37908 28WP..... 1.1 oz	14	14	1.6 f-h	5.3 a-c	13.3 b-d	28.8 d-i	31.3 c-j	35.0 d-j
29 Heritage 50WG..... 0.20 oz	14	14	0.0 h	0.0 c	0.0 d	2.3 hi	2.5 ij	12.5 g-j
30 Banner MAXX 1.3ME.....2.0 fl oz	14	14	3.3 d-h	3.1 bc	7.2 cd	22.3 d-i	26.4 c-j	42.0 c-h
31 QP Enclave 5.3F.....3.0 fl oz	—	—						
+ Foursome 100SL.....0.4fl oz	14	14	20.0 a-e	12.8 a-c	12.5 b-d	27.6 d-i	37.5 b-j	33.5 d-j
32 QP Enclave 5.3F.....4.0 fl oz	—	—						
+ Foursome 100SL.....0.4 fl oz	21	21	2.1 f-h	0.8 c	11.8 cd	22.6 d-i	45.8 b-g	45.2 c-g
33 QP Enclave 5.3F.....3.0 fl oz	—	—						
+ QP Fosetyl-AI 80WG..... 4.0 oz	—	—						
+ Foursome 100SL.....0.4 fl oz	14	14	17.8 a-g	19.7 a-c	31.0 a-d	46.3 b-f	56.6 a-e	64.2 a-d
34 QP Enclave 5.3F.....4.0 fl oz	—	—						
+ QP Fosetyl-AI 80WG..... 4.0 oz	—	—						
+ Foursome 100SL.....0.4 fl oz	21	21	11.6 b-h	22.3 a-c	33.3 a-d	66.8 ab	60.5 a-d	84.8 ab
35 K1.....3.0 fl oz	14	14	21.1 a-c	27.4 a-c	24.3 a-d	57.3 a-d	54.9 a-e	59.1 a-e
36 2012 Summer Patch Prog. #1..Plant-Food	7 ⁶	7 ⁶	4.9 c-h	8.7 a-c	17.9 a-d	46.0 b-f	61.6 a-c	62.8 a-d
37 2012 Summer Patch Prog. #2..Plant-Food	7 ⁷	7 ⁷	7.2 c-h	7.1 a-c	14.6 b-d	31.0 b-i	39.3 b-i	46.0 c-g
38 Torque 3.6SC.....0.6 fl oz	14	14	2.1 f-h	0.0 c	2.5 d	3.2 hi	2.5 ij	15.8 g-j
39 Torque 3.6SC.....0.9 fl oz	14	14	0.8 gh	0.0 c	2.0 d	2.6 hi	0.9 ij	10.8 g-j
40 3336 4F.....3.6 fl oz	—	—						
+Torque 3.6SC.....0.78 fl oz	14	14	1.8 f-h	0.0 c	2.0 d	8.4 g-i	8.8 g-j	7.1 h-j
41 Untreated check..... —	—	—	29.8 a	28.3 a-c	28.7 a-d	40.3 b-g	60.3 a-d	54.1 b-f
		INT ⁸	DAT ⁹	DAT	DAT	DAT	DAT	DAT
		7	7	3	13	24	24	43
		14	14	10	20	31	41	50
		21	7	17	25	38	48	57
		28	14	24	34	45	55	64

(Continued)

Table 1A (continued).

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- 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 H₂O per 1000 sq ft with a CO₂ 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), 29 May (7-day treatment), 5 June (7- and 14-day treatments), 12 June (7- and 21-day treatments), 19 June (7-, 14-, and 28-day treatments), 26 June (7-day treatment), 3 July (7-, 14-, and 21-day treatments), 10 July (7-day treatment), 17 July (7-, 14-, and 28-day treatments), 24 July (7- and 21-day treatments), 31 July (7- and 14-day treatments), and 7 August (7-day treatment).
- ⁴ Treatments 1 to 3 were immediately irrigated with 0.25 gal of water per plot after application.
- ⁵ Treatments 15 and 16 were applied to dry foliage and then immediately irrigated with 1.0 gal of water per plot.
- ⁶ Treatment 36 (2012 Plant-Food Summer Patch Program #1) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.
- ⁷ Treatment 37 (2012 Plant-Food Summer Patch Program #2) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) + Impulse LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.
- ⁸ Spray interval in days.
- ⁹ Days after the last treatment.

Table 1B. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2012.

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Disease Severity Index ^{1,2}		Turf Quality ³		
			3 Oct.	18 June	14 July	11 Aug.	17 Sept.
1 Tourney 50WG.....	0.37 oz	14 ⁵	0.0 g	7.0 a-f	6.3 c-j	7.1 a-d	6.9 ab
2 S-2200 4SC	0.35 fl oz	14 ⁵	15.2 c-g	6.1 e-h	5.3 g-k	5.9 c-f	4.3 h-n
3 S-2200 4SC	0.25 fl oz	—					
+ Tourney 50WG	0.28 oz	14 ⁵	14.3 c-g	6.9 a-g	6.5 b-h	7.0 a-d	5.6 c-f
4 Xzemplar 2.5SC.....	0.21 fl oz	28	17.7 c-g	6.8 a-g	6.4 b-j	7.0 a-d	4.9 f-k
5 Xzemplar 2.5SC.....	0.262 fl oz	28	0.0 g	7.4 a-c	7.4 a-d	7.0 a-d	5.0 f-j
6 Lexicon Intrinsic 4.17SC	0.34 fl oz	28	9.5 e-g	6.0 e-h	5.9 d-j	6.8 a-e	5.1 e-i
7 Lexicon Intrinsic 4.17SC	0.472 fl oz	28	11.8 d-g	7.0 a-f	6.5 b-h	7.1 a-d	5.1 e-i
8 Honor Intrinsic 28WG	1.1 oz	28	16.0 c-g	7.3 a-d	6.8 a-g	7.3 a-d	4.8 f-k
9 Reserve 4.8SC.....	3.0 fl oz	28	64.6 a	5.5 h	6.0 c-j	5.6 d-f	3.3 n-r
10 Triton Flo 3.1SC.....	0.75 fl oz	28	22.3 b-g	7.3 a-d	8.1 a	8.1 a	4.6 f-l
11 Velista 50WDG.....	0.3 oz	14	4.8 e-g	6.5 b-h	5.0 h-k	6.8 a-e	4.3 h-n
12 Velista 50WDG	0.5 oz	14	24.9 b-g	7.5 ab	6.6 a-g	7.3 a-d	3.6 l-q
13 Velista 50WDG	0.3 oz	—					
+ Daconil Ultrex 82.5WDG.....	3.25 oz	14	68.4 a	6.9 a-g	5.5 f-k	6.4 a-f	2.4 r
14 Velista 50WDG.....	0.3 oz	—					
+ Heritage 50WG	0.2 oz	14	4.0 fg	7.4 a-c	6.4 b-i	8.0 ab	7.3 a
15 Pillar 0.8G	48.0 oz	28 ⁶	10.5 d-g	5.8 gh	6.3 c-j	6.8 a-e	5.4 d-g
16 Headway G	60.0 oz	28 ⁶	0.0 g	6.0 e-h	7.5 a-c	7.4 a-d	6.4 a-d
17 NB37904 1.8SC.....	0.50 fl oz	14	8.9 e-g	6.9 a-g	6.6 a-g	6.4 a-f	4.8 f-k
18 NB37904 1.8SC.....	0.66 fl oz	14	9.3 e-g	6.8 a-g	6.1 c-j	6.3 b-f	5.3 e-h
19 NB37904 1.8SC.....	0.75 fl oz	14	13.3 c-g	5.9 f-h	5.8 e-j	7.1 a-d	5.1 e-i
20 NB37904 1.8SC.....	0.75 fl oz	21	13.4 c-g	6.6 a-h	6.4 b-i	6.5 a-f	5.0 f-j
21 NB37904 1.8SC.....	1.0 fl oz	21	6.6 e-g	6.1 d-h	6.1 c-j	6.1 c-f	4.9 f-k
22 NB38205 3.3SC	0.40 fl oz	14	8.8 e-g	6.9 a-g	5.8 e-j	5.1 ef	4.3 g-m
23 NB38205 3.3SC.....	0.50 fl oz	14	21.9 b-g	6.5 b-h	6.6 a-g	6.9 a-e	3.5 m-q
24 NB37908 28WP	1.1 oz	14	7.3 e-g	7.8 a	7.9 ab	7.3 a-d	4.4 g-m
25 Segway 3.3SC.....	0.45 fl oz	14	31.6 b-f	5.9 f-h	4.1 k	5.1 ef	3.9 k-q
26 Affirm 11.3WG.....	0.87 oz	14	10.5 d-g	7.3 a-d	7.4 a-d	8.0 ab	4.1 i-o

(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Disease Severity Index ^{1,2}	Turf Quality ³			
			3 Oct.	18 June	14 July	11 Aug.	17 Sept.
27 NB38205 3.3SC.....	0.40 fl oz	–					
+ NB 37908 28WP.....	1.1 oz	14	12.2 c-g	7.1 a-e	6.4 b-i	6.3 b-f	4.4 g-m
28 NB 38205 3.3SC.....	0.50 fl oz	–					
+ NB 37908 28WP.....	1.1 oz	14	11.6 d-g	7.5 ab	6.3 c-j	6.5 a-f	5.1 e-i
29 Heritage 50WG.....	0.20 oz	14	0.0 g	7.1 a-e	6.8 a-g	7.1 a-d	6.9 ab
30 Banner MAXX 1.3ME.....	2.0 fl oz	14	12.8 c-g	7.5 ab	6.4 b-i	6.9 a-e	4.3 h-n
31 QP Enclave 5.3F.....	3.0 fl oz	–					
+ Foursome 100SL.....	0.4 fl oz	14	17.3 c-g	7.6 ab	6.0 c-j	6.9 a-e	4.1 i-o
32 QP Enclave 5.3F.....	4.0 fl oz	–					
+ Foursome 100SL.....	0.4 fl oz	21	22.8 b-g	7.5 ab	6.5 b-h	7.6 a-c	3.4 m-r
33 QP Enclave 5.3F.....	3.0 fl oz	–					
+ QP Fosetyl-AI 80WG.....	4.0 oz	–					
+ Foursome 100SL.....	0.4 fl oz	14	34.4 b-e	7.3 a-d	6.4 b-i	7.6 a-c	2.9 qr
34 QP Enclave 5.3F.....	4.0 fl oz	–					
+ QP Fosetyl-AI 80WG.....	4.0 oz	–					
+ Foursome 100SL.....	0.4 fl oz	21	50.8 ab	7.6 ab	6.1 c-j	7.6 a-c	3.0 p-r
35 K1.....	3.0 fl oz	14	40.2 a-d	6.3 c-h	4.9 i-k	5.6 d-f	3.1 o-r
36 2012 Summer Patch Prog. #1..Plant-Food		7 ⁷	32.0 b-f	7.8 a	7.0 a-f	7.0 a-d	3.3 n-r
37 2012 Summer Patch Prog. #2..Plant-Food		7 ⁸	33.2 b-f	7.3 a-d	7.1 a-e	7.0 a-d	4.0 j-p
38 Torque 3.6SC.....	0.6 fl oz	14	0.0 g	5.8 gh	6.5 b-h	7.3 a-d	6.1 b-e
39 Torque 3.6SC.....	0.9 fl oz	14	0.0 g	6.6 a-h	6.5 b-h	7.4 a-d	6.5 ab
40 3336 4F.....	3.6 fl oz	–					
+Torque 3.6SC.....	0.78 fl oz	14	0.0 g	6.3 c-h	6.9 a-f	7.5 a-c	5.6 c-f
41 Untreated check.....	–	–	41.8 a-c	6.0 e-h	4.8 jk	4.8 f	3.3 n-r

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(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Disease Severity Index ^{1,2}		Turf Quality ³		
			3 Oct.	18 June	14 July	11 Aug.	17 Sept.
		INT ⁹	DAT ¹⁰	DAT	DAT	DAT	DAT
		7	57	6	4	4	41
		14	64	13	11	11	48
		21	71	6	11	18	55
		28	78	27	4	25	62

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 H₂O per 1000 sq ft with a CO₂ compressed air sprayer, T-Jet nozzle 8003E, at 30 psi. No phytotoxicity was observed in this test.

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

⁴ Fungicides were applied on 22 May (all treatments), 29 May (7-day treatment), 5 June (7- and 14-day treatments), 12 June (7- and 21-day treatments), 19 June (7-, 14-, and 28-day treatments), 26 June (7-day treatment), 3 July (7-, 14-, and 21-day treatments), 10 July (7-day treatment), 17 July (7-, 14-, and 28-day treatments), 24 July (7- and 21-day treatments), 31 July (7- and 14-day treatments), and 7 August (7-day treatment).

⁵ Treatments 1 to 3 were immediately irrigated with 0.25 gal of water per plot after application.

⁶ Treatments 15 and 16 were applied to dry foliage and then immediately irrigated with 1.0 gal of water per plot.

⁷ Treatment 36 (2012 Plant-Food Summer Patch Program #1) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.

⁸ Treatment 37 (2012 Plant-Food Summer Patch Program #2) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) + Impulse LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.

⁹ Spray interval in days.

¹⁰ Days after the last treatment.

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Table 1C. Suppressing summer patch with selected fungicides on Kentucky bluegrass: Rutgers University, 2012.

Treatment	Rate per 1000 sq ft	Application Schedule (days) ³	Color ^{1,2}		
			18 June	14 July	11 Aug.
1 Tourney 50WG	0.37 oz	14 ⁴	3.0 h	2.9 g	3.0 e
2 S-2200 4SC	0.35 fl oz	14 ⁴	3.3 fg	3.1 fg	3.1 e
3 S-2200 4SC	0.25 fl oz	—			
+ Tourney 50WG	0.28 oz	14 ⁴	3.0 h	3.0 fg	3.0 e
4 Xzemplar 2.5SC.....	0.21 fl oz	28	3.0 h	3.0 fg	3.1 e
5 Xzemplar 2.5SC.....	0.262 fl oz	28	3.0 h	3.0 fg	3.0 e
6 Lexicon Intrinsic 4.17SC	0.34 fl oz	28	3.0 h	3.1 fg	3.0 e
7 Lexicon Intrinsic 4.17SC	0.472 fl oz	28	3.0 h	3.0 fg	3.0 e
8 Honor Intrinsic 28WG	1.1 oz	28	3.1 gh	3.1 fg	3.3 de
9 Reserve 4.8SC.....	3.0 fl oz	28	3.5 e	3.8 cd	3.8 bc
10 Triton Flo 3.1SC.....	0.75 fl oz	28	3.3 fg	4.0 bc	3.3 de
11 Velista 50WDG.....	0.3 oz	14	3.0 h	3.0 fg	3.0 e
12 Velista 50WDG	0.5 oz	14	3.1 gh	3.0 fg	3.0 e
13 Velista 50WDG	0.3 oz	—			
+ Daconil Ultrex 82.5WDG.....	3.25 oz	14	3.1 gh	3.1 fg	3.3 de
14 Velista 50WDG.....	0.3 oz	—			
+ Heritage 50WG	0.2 oz	14	3.0 h	3.0 fg	3.0 e
15 Pillar 0.8G	48.0 oz	28 ⁵	3.0 h	3.0 fg	3.3 de
16 Headway G	60.0 oz	28 ⁵	3.0 h	3.5 de	3.5 cd
17 NB37904 1.8SC.....	0.50 fl oz	14	3.0 h	3.0 fg	3.3 de
18 NB37904 1.8SC.....	0.66 fl oz	14	3.0 h	3.0 fg	3.0 e
19 NB37904 1.8SC.....	0.75 fl oz	14	3.0 h	3.0 fg	3.3 de
20 NB37904 1.8SC.....	0.75 fl oz	21	3.0 h	3.0 fg	3.1 e
21 NB37904 1.8SC.....	1.0 fl oz	21	3.0 h	3.0 fg	3.0 e
22 NB38205 3.3SC	0.40 fl oz	14	3.0 h	3.0 fg	3.0 e
23 NB38205 3.3SC.....	0.50 fl oz	14	3.0 h	3.0 fg	3.1 e
24 NB37908 28WP	1.1 oz	14	3.1 gh	3.0 fg	3.0 e
25 Segway 3.3SC	0.45 fl oz	14	3.0 h	3.0 fg	3.3 e
26 Affirm 11.3WG.....	0.87 oz	14	3.0 h	3.3 ef	3.1 e

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(Continued)

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) ³	Color ^{1,2}		
			18 June	14 July	11 Aug.
27 NB38205 3.3SC.....0.40 fl oz		—			
+ NB 37908 28WP.....1.1 oz		14	3.0 h	3.0 fg	3.1 e
28 NB 38205 3.3SC.....0.50 fl oz		—			
+ NB 37908 28WP.....1.1 oz		14	3.1 gh	3.0 fg	3.3 de
29 Heritage 50WG.....0.20 oz		14	3.3 fg	3.1 fg	3.1 e
30 Banner MAXX 1.3ME.....2.0 fl oz		14	3.0 h	3.0 fg	3.3 de
31 QP Enclave 5.3F.....3.0 fl oz		—			
+ Foursome 100SL.....0.4fl oz		14	4.6 b	4.6 a	4.6 a
32 QP Enclave 5.3F.....4.0 fl oz		—			
+ Foursome 100SL.....0.4 fl oz		21	5.0 a	4.6 a	4.5 a
33 QP Enclave 5.3F.....3.0 fl oz		—			
+ QP Fosetyl-AI 80WG.....4.0 oz		—			
+ Foursome 100SL.....0.4 fl oz		14	4.6 b	4.3 b	4.4 a
34 QP Enclave 5.3F.....4.0 fl oz		—			
+ QP Fosetyl-AI 80WG.....4.0 oz		—			
+ Foursome 100SL.....0.4 fl oz		21	4.6 b	4.3 b	4.0 b
35 K1.....3.0 fl oz		14	3.4 ef	3.6 d	3.8 bc
36 2012 Summer Patch Prog. #1..Plant-Food		7 ⁶	4.3 c	3.6 d	3.8 bc
37 2012 Summer Patch Prog. #2..Plant-Food		7 ⁷	4.0 d	3.5 de	3.5 cd
38 Torque 3.6SC.....0.6 fl oz		14	3.1 gh	3.3 ef	3.3 de
39 Torque 3.6SC.....0.9 fl oz		14	3.1 gh	3.3 ef	3.0 e
40 3336 4F.....3.6 fl oz		—			
+Torque 3.6SC.....0.78 fl oz		14	3.1 gh	3.0 fg	3.0 e
41 Untreated check.....—		—	3.0 h	3.0 fg	3.1 e
		INT ⁸	DAT ⁹	DAT	DAT
		7	6	4	4
		14	13	11	11
		21	6	11	18
		28	27	4	25

(Continued)

Table 1C (continued).

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- 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 H₂O per 1000 sq ft with a CO₂ compressed air sprayer, T-Jet nozzle 8003E, at 30 psi. No phytotoxicity was observed in this test.
- ² Color of foliage, where 1 = very chlorotic, 2 = slightly chlorotic, 3 = normal green color, 4 = slight dark green color, and 5 = very dark green color.
- ³ Fungicides were applied on 22 May (all treatments), 29 May (7-day treatment), 5 June (7- and 14-day treatments), 12 June (7- and 21-day treatments), 19 June (7-, 14-, and 28-day treatments), 26 June (7-day treatment), 3 July (7-, 14-, and 21-day treatments), 10 July (7-day treatment), 17 July (7-, 14-, and 28-day treatments), 24 July (7- and 21-day treatments), 31 July (7- and 14-day treatments), and 7 August (7-day treatment).
- ⁴ Treatments 1 to 3 were immediately irrigated with 0.25 gal of water per plot after application.
- ⁵ Treatments 15 and 16 were applied to dry foliage and then immediately irrigated with 1.0 gal of water per plot.
- ⁶ Treatment 36 (2012 Plant-Food Summer Patch Program #1) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.
- ⁷ Treatment 37 (2012 Plant-Food Summer Patch Program #2) consisted of 16-2-7 25% SRN LC (9.0 fl oz) + Mn 5% LC (4.0 fl oz) + Flo Thru 2403 LC (3.0 fl oz) + Phosphite 30 0-0-27 LC (3.0 fl oz) + Organic Acid LC (3.0 fl oz) + Impulse LC (3.0 fl oz) applied every 7 days from 22 May to 28 August.
- ⁸ Spray interval in days.
- ⁹ Days after the last treatment.