

# RUTGERS

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Experiment Station

## **2008 Turfgrass Proceedings**

***The New Jersey Turfgrass Association***

In Cooperation with  
Rutgers Center for Turfgrass Science  
Rutgers Cooperative Extension



# **2008 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, 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 2008 New Jersey Turfgrass Expo. Publication of these lectures provides a readily avail-

able 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

## EFFECT OF FUNGICIDES AND BIORATIONAL PRODUCTS ON BROWN PATCH CONTROL OF A COLONIAL BENTGRASS FAIRWAY, 2008

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Fungicides were evaluated in 2008 for their ability to control brown patch (caused by *Rhizoctonia solani*) at the Rutgers Turf Research Farm in North Brunswick, NJ on colonial bentgrass (*Agrostis capillaris* L.) cv. SR7100 maintained under golf course fairway conditions. Turf was established in 2000 on a Nixon loam with a pH of 6.2. Mowing was performed three times per week at a height of 0.375 inches with clippings collected. The site was irrigated as needed to prevent drought stress.

Fertilizer was applied as 20-0-0 (0.15 lb nitrogen (N)/1000 ft<sup>2</sup>) and 46-0-0 (0.5 lb N/1000 ft<sup>2</sup>) on 27 April, 34-0-0 (0.5 lb N/1000 ft<sup>2</sup>) on 7 May and 26 August, and 20-20-20 (0.2 lb N/1000 ft<sup>2</sup>) on 25 July. Dimension 2EW (12 fl oz/A) was applied on 1 May and 25 June for pre-emergence weed control. Emerald 70WG (0.18 oz/1000 ft<sup>2</sup>) was applied on 22 June to suppress dollar spot (caused by *Sclerotinia homoeocarpa*). Localized dry spots were suppressed with the wetting agent Tricure 100LC (6.0 oz/1000 ft<sup>2</sup>) on 8 May, 10 June, 12 July, and 2 August. Insect pests were controlled with Telstar GC 0.67F (0.25 oz/1000 ft<sup>2</sup>) on 8 July. The site was aerified to a depth of 3.5 inch with 0.5-inch hollow tines on 4-inch centers and topdressed with a sand root zone mix on 1 June. Plots were 3 x 5 ft and were arranged in a randomized complete block with four replications.

Fungicides were applied in water equivalent to 1.9 gal/1000 ft<sup>2</sup> with a CO<sub>2</sub> powered sprayer at 30 psi using TeeJet 8003VS flat fan nozzles. Treatments (trt) were initiated on 3 June when environmental conditions were conducive to brown patch development. Fungicides were reapplied at the appropriate intervals as indicated in Tables 1A, 1B, and 1C. Turf

was visually evaluated for percent turf area infested with brown patch on 13 and 23 June, 2, 14, and 24 July, 6, 15, and 28 August, and 9 September, and with yellow tuft (caused by *Sclerophthora macrospora*) on 9 September. Phytotoxicity was assessed on 14 July and 6 August using a 1 to 5 scale, where 1 = no foliar discoloration, 2 = slight chlorosis or necrosis, 3 = moderate chlorosis or necrosis, 4 = severe chlorosis or necrosis and 5 = all turf dead. Turf quality was rated on 6 August using a 1 to 9 scale, where 9 = best turf quality and 5 = acceptable quality. Data were subjected to analysis of variance and means were separated using the Waller-Duncan *k*-ratio *t*-test (*k* = 100).

Brown patch was first observed on 9 June and became uniform throughout the study by 13 June (Tables 1A and 1B). Disease severity ranged from 41 to 74% turf area infested with *R. solani* on untreated turf (Tables 1A and 1B), which was considered a moderate to severe level of brown patch infestation, respectively. Less than 10% turf area infested per plot represented an acceptable level of disease control. Approximately 11% of the treatments in this study [i.e., RU192514D-08 EC (trts 1, 2), RU192514J-08 EC (trts 3 to 6), RU192514J-08 EC + RU192514B-08 ME (trts 7, 8), Insignia 20WG (trt 24), and the RU BP Program (trt 80)] provided season-long control (3 June to 9 September) of brown patch. EXC3949 0.28GR (trt 47), Heritage TL 0.8ME @ 2.0 fl oz every 21 days (trt 48), and Legacy B 3.1SC + Chipco Signature 80WG alternated with Chipco Signature 80WG + Daconil Ultrex 82.5WDG (trt 71) also adequately suppressed this disease through 9 September with only one or two slight reductions in control (> 10% disease) during the study.

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Several products provided good residual brown patch control through 15 August [Emerald 70WG @ 0.13 oz + Iprodione Pro 2SC @ 3.0 fl oz (trt 18), Trinity 1.67SC @ 1.0 fl oz + Iprodione Pro 2SC @ 4.0 fl oz (trt 22), RU22112-08A SC + RU22112-08B WG (trt 33), and Autograph 70WDG @ 4.57 oz + Kestrel 1.3ME @ 2.0 fl oz + Pegasus HPX 6F @ 2.0 fl oz (trt 38)] and through 28 August [Emerald 70WG @ 0.13 oz + Iprodione Pro 2SC @ 4.0 fl oz (trt 19), RU42116-08D WG (trt 27), RU42116-08E WG @ 0.25 oz (trt 29) and 0.3 oz (trt 30), Autograph 70WDG @ 4.57 oz + Kestrel 1.3ME @ 2.0 fl oz + Pegasus HPX 6F @ 3.6 fl oz (trt 39), Chipco Signature 80WG + Banner MAXX 1.3ME + Daconil Weatherstik 6F (trts 40, 41), Legacy B 3.1SC @ 1.1 fl oz (trt 70), RU22112-08B WG (trt 75), and Heritage TL 0.8ME @ 1.0 fl oz every 14 days (trt 78)], 17 and 30 days after the last fungicide application, respectively. Of the treatments applied on a curative basis (trts 51 to 58) on 17 June, only Legacy B 3.1SC + Chipco Signature 80WG (trt 56) and Legacy B 3.1SC + Chipco Signature 80WG + Primo 1EC (trt 58) reduced the disease to acceptable levels within a 2-week period (by 2 July). Legacy B 3.1SC @ 0.55 fl oz (trt 68) and 0.75 fl oz (trt 69) also afforded good brown patch control through the treatment period (3 June through 12 August).

Insignia 20WG (trt 24), Autograph 70WDG @ 4.57 oz + Kestrel 1.3ME @ 2.0 fl oz + Pegasus HPX 6F @ 3.6 fl oz (trt 39), Chipco Signature 80WG 4.0 oz + Banner MAXX 1.3ME 2.0 fl oz + Daconil Weatherstik 6F 3.6 fl oz (trt 41), Legacy B 3.1SC @ 0.4 fl oz (trt 67), and Legacy B 3.1SC @ 0.55 fl oz (trt 68) suppressed yellow tuft on 9 September compared to untreated turf (Table 1C). Turf quality was acceptable (greater or equal to 5.0) for all products evaluated in this study on 6 August, except for RU192514I-08 WG (trt 10), Fungicide X 1.3GR (trt 50), and MOI-106 + Sync 100XL (trt 81) due to poor disease control, and Vitalonil 1.375L + Kestrel 1.3ME alternated with Vitalonil 1.375L + Dovetail 3.74F (trt 26), Autograph 70WDG @ 4.57 oz + Kestrel 1.3ME @ 2.0 fl oz + Pegasus HPX 6F @ 3.6 fl oz (trt 39), Chipco Signature 80WG + Banner MAXX 1.3ME + Daconil Weatherstik 6F (trts 40, 41), RU22112-08C WP + RU22112-08B WG (trt 73), and RU22112-08C WG (trt 74) because of moderate to severe phytotoxicity observed on that date. Slight phytotoxicity was also noticed on 14 July and/or 6 August for turf treated with Autograph 70WDG @ 4.57 oz + Kestrel 1.3ME @ 2.0 fl oz + Pegasus HPX 6F @ 2.0 fl oz (trt 38), Banner MAXX 1.3ME (trt 44), and Dewcure LC (trt 76).

Table 1A. Effect of fungicides and biorational products on brown patch on a colonial bentgrass fairway: Rutgers University, 2008.

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>				
			13 June	23 June	2 July	14 July	24 July
1 RU192514D-08 EC .....	0.63 fl oz	14	0.0 s	4.3 s-u	6.3 w-z'b'	2.5 u-w	3.8 t-w
2 RU192514D-08 EC .....	1.26 fl oz	14	0.0 s	2.5 tu	0.0 z'b'	0.0 w	3.0 t-w
3 RU192514J-08 EC .....	0.196 fl oz	14	0.0 s	0.5 u	6.3 w-z'b'	8.8 p-w	3.8 t-w
4 RU192514J-08 EC .....	0.393 fl oz	14	0.0 s	0.0 u	5.0 x-z'b'	2.5 u-w	2.5 u-w
5 RU192514J-08 EC .....	0.785 fl oz	14	0.0 s	0.0 u	5.0 x-z'b'	2.5 u-w	2.5 u-w
6 RU192514J-08 EC .....	1.57 fl oz	14	0.0 s	0.0 u	0.0 z'b'	0.0 w	0.0 w
7 RU192514J-08 EC .....	0.393 fl oz						
+ RU192514B-08 ME .....	0.503 fl oz	14	0.0 s	1.3 u	3.0 y-z'b'	7.5 q-w	1.3 vw
8 RU192514J-08 EC .....	0.785 fl oz						
+ RU192514B-08 ME .....	0.503 fl oz	14	0.0 s	0.0 u	1.3 z'a'b'	2.5 u-w	0.0 w
9 RU192514B-08 ME .....	1.01 fl oz	14	0.0 s	1.3 u	13.8 r-y	26.3 i-l	13.8 l-s
10 RU192514I-08 WG .....	0.12 oz	14	0.0 s	2.0 tu	25.0 k-q	45.0 d-f	45.0 de
11 RU192514B-08ME .....	0.503 fl oz	14	0.0 s	3.8 s-u	25.0 k-q	26.3 i-l	10.0 o-v
12 Emerald 70WG .....	0.13 oz	14	37.5 h-j	21.3 j-q	27.5 j-o	27.5 i-k	23.8 g-k
13 Prostar 70W .....	2.2 oz	14	20.0 lm	2.5 tu	7.5 v-z'b'	12.5 n-t	15.0 k-r
14 Emerald 70WG .....	0.13 oz						
+ T-Methyl 4.5SC .....	3.0 fl oz	14	22.5 kl	22.5 i-p	7.5 v'-z'b'	15.0 m-r	16.3 j-q
15 Emerald 70WG .....	0.13 oz						
+ T-Methyl 4.5SC .....	4.0 fl oz	14	21.3 lm	28.8 f-m	26.3 k-p	15.0 m-r	12.5 m-t
16 Emerald 70WG .....	0.13 oz						
+ Trinity 1.67SC .....	0.75 fl oz	14	5.0 p-s	3.8 s-u	26.3 k-p	15.0 m-r	23.8 g-k
17 Emerald 70WG .....	0.13 oz						
+ Trinity 1.67SC .....	1.0 fl oz	14	1.3 rs	5.0 r-u	26.3 k-p	12.5 n-t	16.3 j-q
18 Emerald 70WG .....	0.13 oz						
+ Iprodione Pro 2SC .....	3.0 fl oz	14	6.3 o-s	2.5 tu	8.8 v-z'b'	10.0 o-v	13.8 l-s
19 Emerald 70WG .....	0.13 oz						
+ Iprodione Pro 2SC .....	4.0 fl oz	14	0.5 rs	0.0 u	7.5 v-z'b'	1.3 vw	1.3 vw
20 Trinity 1.67SC .....	1.0 fl oz						
+ Iprodione Pro 2SC .....	2.0 fl oz	14	6.3 o-s	5.0 r-u	13.8 r-y	17.5 l-p	20.0 h-n

269

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Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>				
			13 June	23 June	2 July	14 July	24 July
21 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....3.0 fl oz		14	1.3 rs	0.0 u	5.0 x-z'b'	8.8 p-w	16.3 j-q
22 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....4.0 fl oz		14	0.0 s	0.0 u	2.5 z-z'b'	5.0 s-w	8.8 p-w
23 Curalan EG 50WG ..... 1.0 oz		14	33.8 ij	47.5 a-e	55.0 bc	48.8 de	43.8 de
24 Insignia 20WG ..... 0.5 oz		14	2.5 q-s	2.5 tu	10.0 u-z'b'	3.8 t-w	2.5 u-w
25 Trinity 1.67SC .....1.0 fl oz		14	8.8 n-r	17.5 l-t	23.8 k-r	15.0 m-r	15.0 k-r
26 Vitalonil 1.375L.....6.0 fl oz + Kestrel 1.3ME .....1.0 fl oz /Vitalonil 1.375L.....6.0 fl oz + Dovetail 3.74F.....2.0 fl oz		14 <sup>3</sup>					
27 RU42116-08D WG ..... 0.2 oz		14	5.0 p-s	0.0 u	0.0 z'b'	1.3 vw	2.5 u-w
28 RU42116-08E WG ..... 0.2 oz		14	1.3 rs	0.0 u	5.0 x-z'b'	6.3 r-w	7.5 q-w
29 RU42116-08E WG ..... 0.25 oz		14	0.0 s	0.0 u	1.3 z'a'b'	3.8 t-w	6.3 r-w
30 RU42116-08E WG ..... 0.3 oz		14	0.0 s	0.0 u	0.0 z'b'	1.3 vw	2.5 u-w
31 RU22112-08A SC.....0.26 fl oz		14	15.0 l-n	35.0 e-j	31.3 h-m	40.0 e-g	31.3 fg
32 RU22112-08B WG ..... 0.18 oz		14	8.8 n-r	11.8 n-u	17.5 o-v	17.5 l-p	12.5 m-t
33 RU22112-08A SC.....0.26 fl oz + RU22112-08B WG ..... 0.18 oz		14	2.5 q-s	1.3 u	5.0 x-z'b'	3.8 t-w	6.3 r-w
34 RU22112-08A SC.....0.52 fl oz		14	11.3 n-p	25.0 g-n	37.5 f-j	40.0 e-g	31.3 fg
35 RU22112-08A SC.....1.04 fl oz		14	7.5 n-s	11.3 n-u	26.3 k-p	31.3 g-i	20.0 h-n
36 RU22112-08A SC.....2.08 fl oz		14	2.5 q-s	10.0 n-u	16.3 p-w	26.3 i-l	18.8 i-o
37 Endorse 2.5W ..... 4.0 oz		14	3.8 p-s	5.0 r-u	13.8 r-y	11.3 n-u	3.8 t-w
38 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....2.0 fl oz		14	0.0 s	0.0 u	0.0 z'b'	0.0 w	2.5 u-w
39 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....3.6 fl oz		14	0.0 s	0.0 u	0.0 z'b'	2.5 u-w	0.0 w

(Continued)

Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>				
			13 June	23 June	2 July	14 July	24 July
40 Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....2.0 fl oz		14	0.0 s	1.3 u	3.8 y-z'b'	6.3 r-w	0.0 w
41 Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....3.6 fl oz		14	0.0 s	0.0 u	0.0 z'b'	3.8 t-w	0.0 w
42 Legacy F 1.67SC .....1.0 fl oz		21	5.0 p-s	7.5 p-u	11.3 t-z'a'	23.8 i-m	10.0 o-v
43 Trinity 1.67SC .....1.0 fl oz		21	10.0 n-q	18.8 k-s	27.5 j-o	23.8 i-m	11.3 n-u
44 Banner MAXX 1.3ME .....1.6 fl oz		14	7.5 n-s	20.0 j-r	32.5 g-l	28.8 h-j	21.3 h-m
45 A14912A 0.31GR ..... 64.0 oz		21 <sup>4</sup>	8.8 n-r	3.8 s-u	12.5 s-z	20.0 j-n	23.8 g-k
46 A14912C 0.31GR..... 64.0 oz		21 <sup>4</sup>	3.8 p-s	7.5 p-u	11.3 t-z'a'	20.0 j-n	23.8 g-k
47 EXC3949 0.28GR ..... 71.0 oz		21 <sup>4</sup>	0.0 s	6.3 q-u	7.5 v-z'b'	16.3 m-q	0.0 w
48 Heritage TL 0.8ME .....2.0 fl oz		21	1.8 q-s	2.5 tu	10.0 u-z'b'	11.3 n-u	7.5 q-w
49 Compass G 0.157GR..... 64.0 oz		21 <sup>4</sup>	2.5 q-s	20.0 j-r	30.0 i-n	27.5 i-k	25.0 g-j
50 Fungicide X 1.3GR..... 76.0 oz		21 <sup>4</sup>	42.5 e-h	38.8 c-h	50.0 b-e	37.5 f-h	26.3 g-i
51 Chipco Triton 70WDG ..... 0.273 oz		Cur14 <sup>5</sup>	42.5 e-h	37.5 d-i	45.0 c-f	23.8 i-m	23.8 g-k
52 Legacy B 3.1SC .....0.5 fl oz		Cur14 <sup>5</sup>	40.0 g-i	38.8 c-h	22.5 l-s	13.8 n-s	10.0 o-v
53 Chipco Triton 70WDG ..... 0.273 oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	46.3 d-g	40.0 b-g	41.3 d-h	45.0 d-f	40.0 ef
54 Legacy B 3.1SC .....0.5 fl oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	55.0 a-c	53.8 a-c	37.5 f-j	23.8 i-m	11.3 n-u
55 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz		Cur14 <sup>5</sup>	40.0 g-i	20.0 j-r	10.0 u-z'b'	13.8 n-s	2.5 u-w
56 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz		Cur14 <sup>5</sup>	50.0 b-e	15.0 l-u	0.0 z'b'	6.3 r-w	0.0 w
57 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 o + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	57.5 ab	17.5 l-t	17.5 o-v	18.8 k-o	6.3 r-w
58 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	48.8 c-f	30.0 f-l	8.8 v-z'b'	16.3 m-q	3.8 t-w

(Continued)

Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>				
			13 June	23 June	2 July	14 July	24 July
59 Chipco Triton 70WDG .....	0.273 oz	28	13.8 m-o	23.8 h-o	47.5 b-f	40.0 e-g	21.3 h-m
60 Legacy B 3.1SC .....	0.5 fl oz	28	1.3 rs	1.3 u	15.0 q-x	15.0 m-r	28.8 gh
61 Chipco Triton 70WDG .....	0.273 oz	28	36.3 h-j	7.5 p-u	28.8 j-n	26.3 i-l	7.5 q-w
+ Primo 1EC.....	0.125 fl oz						
62 Legacy B 3.1SC .....	0.5 fl oz	28	1.3 rs	1.3 u	6.3 w-z'b'	3.8 t-w	20.0 h-n
+ Primo 1EC.....	0.125 fl oz						
63 Chipco Triton 70WDG .....	0.273 oz	28	7.5 n-s	43.8 b-f	28.8 j-n	32.5 g-i	20.0 h-n
+ Chipco Signature 80WG .....	4.0 oz						
64 Legacy B 3.1 SC .....	0.5 fl oz	28	3.8 p-s	11.3 n-u	6.3 w-z'b'	5.0 s-w	17.5 i-p
+ Chipco Signature 80WG .....	4.0 oz						
65 Chipco Triton 70WDG .....	0.273 oz	28	30.0 jk	15.0 l-u	16.3 p-w	13.5 n-s	21.3 h-m
+ Chipco Signature 80WG .....	4.0 oz						
+ Primo 1EC.....	0.125 fl oz						
66 Legacy B 3.1SC .....	0.5 fl oz	28	5.0 p-s	8.8 o-u	3.8 y-z'b'	5.0 s-w	22.5 g-l
+ Chipco Signature 80WG .....	4.0 oz						
+ Primo 1EC .....	0.125 fl oz						
67 Legacy B 3.1SC .....	0.4 fl oz	14	2.5 q-s	1.3 u	3.8 y-z'b'	10.0 o-v	6.3 r-w
68 Legacy B 3.1SC .....	0.55 fl oz	14	0.0 s	2.5 tu	3.8 y-z'b'	5.0 s-w	6.3 r-w
69 Legacy B 3.1SC .....	0.75 fl oz	14	0.0 s	1.3 u	2.5 z-z'b'	5.0 s-w	3.8 t-w
70 Legacy B 3.1SC .....	1.1 fl oz	14	0.0 s	0.0 u	0.0 z'b'	3.3 t-w	2.5 u-w
71 Legacy B 3.1SC .....	0.4 fl oz	14 <sup>6</sup>	0.0 s	0.0 u	0.0 z'b'	6.3 r-w	0.0 w
+ Chipco Signature 80WG .....	4.0 oz						
/ Chipco Signature 80WG .....	4.0 oz						
+ Daconil Ultrex 82.5WG .....	3.2 oz						
72 CX3205 EC .....	2.57 fl oz	7	42.5 e-h	43.8 b-f	67.5 a	51.3 b-d	38.8 ef
73 RU22112-08C WP.....	4.92 oz	14	0.0 s	13.8 m-u	28.8 j-n	46.3 d-f	42.5 de
+ RU22112-08B WG .....	0.28 oz						
74 RU22112-08C WP.....	9.84 oz	14	2.5 q-s	27.5 g-m	33.8 g-k	48.8 de	51.3 b-d
75 RU22112-08B WG .....	0.28 oz	14	7.5 n-s	5.0 r-u	10.0 u-z'b'	8.8 p-w	2.5 u-w
76 Dewcure.....	4.0 fl oz	14	58.8 a	61.3 a	56.3 b	48.8 de	40.0 ef

(Continued)



Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>				
			13 June	23 June	2 July	14 July	24 July
77 Chipco 26GT 2SC.....	4.0 fl oz	14	0.0 s	2.5 tu	15.0 q-x	11.3 n-u	1.3 vw
78 Heritage TL 0.8ME.....	1.0 fl oz	14	0.0 s	0.0 u	5.0 x-z'b'	8.8 p-w	8.8 p-w
79 Heritage TL 0.8ME.....	2.0 fl oz	28	1.3 rs	2.5 tu	16.3 p-w	10.0 o-v	5.0 s-w
80 RU Program.....	—	VAR <sup>7</sup>	0.0 s	2.5 tu	11.3 t-z'a'	15.0 m-r	10.0 o-v
81 MOI-106.....	2.56 fl oz	Cur14 <sup>8</sup>	40.0 g-i	52.5 a-d	21.3 m-t	32.5 g-i	62.5 a
+ Sync 100XL.....	0.32 fl oz						
82 MOI-106.....	2.56 fl oz	Cur14 <sup>8</sup>	58.8 a	60.0 a	25.0 k-q	20.0 j-n	60.0 ab
+ Daconil Ultrex 82.5WDG.....	1.8 oz						
+ Sync 100XL.....	0.32 fl oz	Cur14 <sup>8</sup>	47.5 c-g	51.3 a-d	20.0 n-u	13.8 n-s	23.8 g-k
83 MOI-106.....	2.56 fl oz						
+ Heritage 50WG.....	0.1 oz	Cur14 <sup>8</sup>	47.5 c-g	51.3 a-d	20.0 n-u	13.8 n-s	23.8 g-k
+ Sync 100XL.....	0.32 fl oz						
84 Untreated check.....	—	—	52.5 a-d	43.8 b-f	42.5 d-g	61.3 a	55.0 a-c
85 Untreated check.....	—	—	52.5 a-d	51.3 a-d	40.0 e-i	62.5 a	55.0 a-c
86 Untreated check.....	—	—	41.3 f-i	47.5 a-e	53.8 bc	53.8 a-d	47.5 c-e
87 Untreated check.....	—	—	50.0 b-e	55.0 ab	42.5 d-g	48.8 de	45.0 de
88 Untreated check.....	—	—	47.5 c-g	51.3 a-d	40.0 e-i	58.8 a-c	47.5 c-e
89 Untreated check.....	—	—	41.3 f-i	60.0 a	56.3 b	60.0 ab	42.5 de
90 Untreated check.....	—	—	53.8 a-d	33.8 e-k	51.3 b-d	50.0 cd	41.3 d
91 Untreated check.....	—	—	52.5 a-d	53.8 a-c	51.3 b-d	50.0 cd	41.3 d
		INT <sup>9</sup>	DAT <sup>10</sup>	DAT	DAT	DAT	DAT
		7	3	6	1	6	2
		14	10	6	1	13	9
		21	10	20	8	20	9
		28	10	20	1	13	23

273

(Continued)

Table 1A (continued).

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- <sup>1</sup> 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).
- <sup>2</sup> Fungicides were applied on 3 June (all treatments except treatments 1 to 11, 50, 51 to 58, and 81 to 83), 10 June (7-day treatment and initiated treatment 50), 17 June (7- and 14-day treatments and initiated treatments 1 to 11 and 51 to 58), 24 June (7- and 21-day treatments), 1 July (7-, 14- and 28-day treatments and initiated treatments 81 to 83), 8 July (7-day treatment), 15 July (7-, 14-, and 21-day treatments and last application for treatments 1 to 11), 22 July (7-day treatment), 29 July (7-, 14-, and 28-day treatments), 5 August (7- and 21-day treatments), and 12 August (treatments 26, 71, and 80). Daconil Ultrex 82.5WDG was applied @ 2.75 oz/1,000 sq ft to treatments 1 to 11 and 50 on 3 June and to treatments 81 to 83 on 24 June to suppress brown patch prior to the initiation of these entries.
- <sup>3</sup> Alternation of fungicides on a 14-day schedule, where treatment 26 received Vitalonil 1.375L + Kestrel 1.3ME on 3 and 17 June, 29 July, and 12 August and Vitalonil 1.375L + Dovetail 3.74F on 1 and 15 July.
- <sup>4</sup> Treatments 45 to 47, 49, and 50 were applied to dry foliage and then immediately irrigated with 0.33 gal of water per 3 X 5 ft plot.
- <sup>5</sup> Treatments 51 to 58 were initiated on a curative basis on 17 June.
- <sup>6</sup> Alternation of fungicides on a 14-day schedule, where treatment 71 received Legacy B 3.1SC + Chipco Signature 80WG on 3 June, 1 and 29 July and Chipco Signature 80WG + Daconil Ultrex 82.5WG on 17 June, 15 July, and 12 August.
- <sup>7</sup> Variable spray schedule, where treatment 80 (Rutgers Program) consisted of Daconil Ultrex 82.5WDG (3.2 oz) on 3 June, Insignia 20WG (0.5 oz) on 17 June, ProStar 70W (2.2 oz) + Banner MAXX 1.3ME (0.5 fl oz) + Banol 6L (1.0 fl oz) on 1 July, Endorse 2.5W (4.0 oz) + 3336 4F (4.0 fl oz) + Subdue MAXX 2MC (1.0 fl oz) on 15 July, Chipco 26GT 2SC (4.0 fl oz) + Chipco Signature 80WG (4.0 oz) on 29 July, and Emerald 70WG (0.13 oz) + ProStar 70W (2.2 oz) on 12 August.
- <sup>8</sup> Treatments 81 to 83 were initiated on a curative basis on 1 July.
- <sup>9</sup> Spray interval in days.
- <sup>10</sup> Days after the last treatment.

Table 1B. Effect of fungicides and biorational products on brown patch on a colonial bentgrass fairway: Rutgers University, 2008.

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>			
			6 Aug.	15 Aug.	28 Aug.	9 Sept.
1 RU192514D-08 EC	0.63 fl oz	14	8.3 z-z'i'	3.3 q-w	6.3 s-x	6.3 y-z'b'
2 RU192514D-08 EC	1.26 fl oz	14	6.3 z'c'-i'	2.5 r-w	5.0 t-x	3.8 z-z'b'
3 RU192514J-08 EC	0.196 fl oz	14	4.8 z'd'-i'	0.8 vw	5.0 t-x	1.3 z'a'b'
4 RU192514J-08 EC	0.393 fl oz	14	4.0 z'f'-i'	0.5 w	2.5 v-x	0.0 z'b'
5 RU192514J-08 EC	0.785 fl oz	14	4.0 z'f'-i'	0.5 w	2.5 v-x	0.0 z'b'
6 RU192514J-08 EC	1.57 fl oz	14	0.3 z'i'	0.0 w	0.0 x	0.0 z'b'
7 RU192514J-08 EC	0.393 fl oz					
+ RU192514B-08 ME	0.503 fl oz	14	4.8 z'd'-i'	5.3 q-w	1.3 wx	0.0 z'b'
8 RU192514J-08 EC	0.785 fl oz					
+ RU192514B-08 ME	0.503 fl oz	14	3.5 z'g'-i'	0.3 w	0.0 x	0.0 z'b'
9 RU192514B-08 ME	1.01 fl oz	14	23.5 o-s	13.5 j-t	10.0 p-x	21.3 o-u
10 RU192514I-08 WG	0.12 oz	14	43.3 jk	58.8 c	52.5 b	22.5 n-t
11 RU192514B-08ME	0.503 fl oz	14	15.3 s-z'b'	21.3 g-m	33.8 f-j	47.5 a-f
12 Emerald 70WG	0.13 oz	14	23.3 o-t	41.0 de	25.0 i-n	32.5 h-n
13 Prostar 70W	2.2 oz	14	8.5 z-z'i'	4.3 q-w	2.5 v-x	7.5 x-z'b'
14 Emerald 70WG	0.13 oz					
+ T-Methyl 4.5SC	3.0 fl oz	14	12.5 u-z'e'	6.8 p-w	13.8 n-v	46.3 b-g
15 Emerald 70WG	0.13 oz					
+ T-Methyl 4.5SC	4.0 fl oz	14	17.3 q-y	5.5 q-w	16.3 l-t	45.0 c-g
16 Emerald 70WG	0.13 oz					
+ Trinity 1.67SC	0.75 fl oz	14	18.3 q-w	6.8 p-w	13.8 n-v	30.0 j-o
17 Emerald 70WG	0.13 oz					
+ Trinity 1.67SC	1.0 fl oz	14	9.8 x-z'h'	5.5 q-w	13.8 n-v	32.5 h-n
18 Emerald 70WG	0.13 oz					
+ Iprodione Pro 2SC	3.0 fl oz	14	8.3 z-z'i'	7.5 o-w	13.8 n-v	33.8 h-m
19 Emerald 70WG	0.13 oz					
+ Iprodione Pro 2SC	4.0 fl oz	14	3.5 z'g'-i'	1.0 vw	5.0 t-x	28.8 k-p
20 Trinity 1.67SC	1.0 fl oz					
+ Iprodione Pro 2SC	2.0 fl oz	14	9.5 y-z'h'	1.3 u-w	3.8 u-x	25.0 m-s

275

(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>			
			6 Aug.	15 Aug.	28 Aug.	9 Sept.
21 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....3.0 fl oz		14	5.5 z'd'-i'	1.8 s-w	2.5 v-x	20.5 o-v
22 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....4.0 fl oz		14	7.0 z'b'-i'	1.8 s-w	12.5 o-w	21.3 o-u
23 Curalan EG 50WG ..... 1.0 oz		14	47.8 h-k	61.5 bc	43.8 b-f	32.5 h-n
24 Insignia 20WG ..... 0.5 oz		14	7.5 z'b'-i'	2.0 r-w	0.0 x	0.0 z'b'
25 Trinity 1.67SC .....1.0 fl oz		14	20.0 p-u	25.8 f-h	27.5 h-l	41.3 d-i
26 Vitalonil 1.375L.....6.0 fl oz + Kestrel 1.3ME .....1.0 fl oz / Vitalonil 1.375L.....6.0 fl oz + Dovetail 3.74F.....2.0 fl oz		14 <sup>3</sup>				
27 RU42116-08D WG ..... 0.2 oz		14	50.5 e-j	39.0 de	7.5 r-x	8.8 w-z'b'
28 RU42116-08E WG ..... 0.2 oz		14	4.3 z'e'-i'	5.0 q-w	10.0 p-x	15.0 s-y
29 RU42116-08E WG ..... 0.25 oz		14	11.8 u-z'g'	9.5 n-w	12.5 o-w	27.5 l-q
30 RU42116-08E WG ..... 0.3 oz		14	7.5 z'b'-i'	9.8 m-w	8.8 q-x	16.3 r-y
31 RU22112-08A SC.....0.26 fl oz		14	4.0 z'f'-i'	9.5 n-w	8.8 q-x	16.8 q-x
32 RU22112-08B WG ..... 0.18 oz		14	44.8 jk	44.8 d	42.5 b-g	4.0 e-j
33 RU22112-08A SC.....0.26 fl oz + RU22112-08B WG ..... 0.18 oz		14	10.0 w-z'h'	5.5 q-w	20.0 k-q	38.8 f-k
34 RU22112-08A SC.....0.52 fl oz		14	2.8 z'h'i'	1.5 t-w	13.8 n-v	48.8 a-f
35 RU22112-08A SC.....1.04 fl oz		14	30.8 m-o	60.0 c	40.0 c-g	42.5 d-h
36 RU22112-08A SC.....2.08 fl oz		14	17.8 q-y	32.5 ef	38.8 d-h	41.3 d-i
37 Endorse 2.5W ..... 4.0 oz		14	18.8 q-v	13.8 i-s	16.3 l-t	25.0 m-s
38 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....2.0 fl oz		14	6.0 z'c'-i'	11.5 k-w	18.8 l-r	38.8 f-k
39 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....3.6 fl oz		14	— <sup>2</sup>	5.5 q-w	15.0 m-u	40.0 e-j
		14	— <sup>2</sup>	4.0 q-w	6.3 s-x	26.3 l-r

276

(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>			
			6 Aug.	15 Aug.	28 Aug.	9 Sept.
40 Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....2.0 fl oz		14	— <sup>2</sup>	0.0 w	10.0 p-x	25.0 m-s
41 Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....3.6 fl oz		14	— <sup>2</sup>	0.0 w	2.5 v-x	18.8 o-v
42 Legacy F 1.67SC .....1.0 fl oz		21	24.0 n-q	18.5 g-p	17.5 l-s	33.8 h-m
43 Trinity 1.67SC .....1.0 fl oz		21	25.0 n-q	15.0 h-q	17.5 l-s	30.0 j-o
44 Banner MAXX 1.3ME .....1.6 fl oz		14	32.3 l-n	46.0 d	21.3 k-p	28.8 k-p\
45 A14912A 0.31GR ..... 64.0 oz		21 <sup>4</sup>	18.3 q-w	9.3 n-w	7.5 r-x	10.0 v-z'b'
46 A14912C 0.31GR ..... 64.0 oz		21 <sup>4</sup>	14.3 u-z'c'	4.8 q-w	3.8 u-x	8.8 w-z'b'
47 EXC3949 0.28GR ..... 71.0 oz		21 <sup>4</sup>	3.5 z'g'-i'	1.8 s-w	1.3 wx	8.8 w-z'b'
48 Heritage TL 0.8ME .....2.0 fl oz		21	12.5 u-z'e'	2.5 r-w	0.0 x	0.0 z'b'
49 Compass G 0.157GR..... 64.0 oz		21 <sup>4</sup>	48.5 g-j	38.3 de	31.3 g-k	46.3 b-g
50 Fungicide X 1.3GR..... 76.0 oz		21 <sup>4</sup>	44.8 jk	59.5 c	43.8 b-f	41.3 d-i
51 Chipco Triton 70WDG ..... 0.273 oz		Cur14 <sup>5</sup>	18.0 q-x	20.3 g-n	26.3 i-m	31.3 i-o
52 Legacy B 3.1SC .....0.5 fl oz		Cur14 <sup>5</sup>	5.3 z'd'-i'	8.3 o-w	35.0 e-i	36.3 g-l
53 Chipco Triton 70WDG ..... 0.273 oz + Primo 1EC .....0.125 fl oz		Cur14 <sup>5</sup>	11.3 v-z'g'	10.5 l-w	17.5 l-s	22.5 n-t
54 Legacy B 3.1SC .....0.5 fl oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	8.0 z'a'-i'	2.5 r-w	2.5 v-x	40.0 e-j
55 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz		Cur14 <sup>5</sup>	12.3 u-z'f'	9.3 n-w	11.3 o-x	38.8 e-j
56 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz		Cur14 <sup>5</sup>	3.5 z'g'-i'	12.8 j-v	15.0 m-u	32.5 h-n
57 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	10.3 w-z'h'	6.0 q-w	5.0 t-x	26.3 l-r
58 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz		Cur14 <sup>5</sup>	11.0 v-z'h'	11.8 k-w	6.3 s-x	22.5 n-t

(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>			
			6 Aug.	15 Aug.	28 Aug.	9 Sept.
59 Chipco Triton 70WDG .....	0.273 oz	28	34.8 lm	25.0 f-i	20.0 k-q	26.3 l-r
60 Legacy B 3.1SC .....	0.5 fl oz	28	28.8 m-o	20.5 g-n	13.8 n-v	23.8 m-t
61 Chipco Triton 70WDG .....	0.273 oz	28	31.5 m-o	22.0 f-l	5.0 t-x	13.8 t-z
+ Primo 1EC.....	0.125 fl oz					
62 Legacy B 3.1SC .....	0.5 fl oz	28	40.0 kl	28.0 fg	3.8 u-x	17.5 p-w
+ Primo 1EC.....	0.125 fl oz					
63 Chipco Triton 70WDG .....	0.273 oz	28	27.3 m-p	22.3 f-k	26.3 i-m	53.8 a-c
+ Chipco Signature 80WG .....	4.0 oz					
64 Legacy B 3.1 SC .....	0.5 fl oz	28	16.5 r-z	15.0 h-q	20.0 k-q	30.0 j-o
+ Chipco Signature 80WG .....	4.0 oz					
65 Chipco Triton 70WDG .....	0.273 oz	28	50.3 f-j	23.5 f-j	5.0 t-x	31.3 i-o
+ Chipco Signature 80WG .....	4.0 oz					
+ Primo 1EC.....	0.125 fl oz					
66 Legacy B 3.1SC .....	0.5 fl oz	28	23.8 o-r	7.5 o-w	2.5 v-x	16.3 r-y
+ Chipco Signature 80WG .....	4.0 oz					
+ Primo 1EC.....	0.125 fl oz					
67 Legacy B 3.1SC .....	0.4 fl oz	14	12.8 u-z'd'	15.0 h-q	27.5 h-l	28.8 k-p
68 Legacy B 3.1SC .....	0.55 fl oz	14	8.8 z-z'h'	13.3 j-u	22.5 j-o	30.0 j-o
69 Legacy B 3.1SC .....	0.75 fl oz	14	8.3 z-z'i'	11.5 k-w	25.0 i-n	30.0 j-o
70 Legacy B 3.1SC .....	1.1 fl oz	14	5.8 z'd'-i'	2.0 r-w	5.0 t-x	30.0 j-o
71 Legacy B 3.1SC .....	0.4 fl oz	14 <sup>6</sup>	15.0 t-z'b'	3.8 q-w	2.5 v-x	0.0 z'b'
+ Chipco Signature 80WG .....	4.0 oz					
/ Chipco Signature 80WG .....	4.0 oz					
+ Daconil Ultrex 82.5WG .....	3.2 oz					
72 CX3205 EC .....	2.57 fl oz	7	55.8 c-h	68.3 a-c	66.3 a	46.3 b-g
73 RU22112-08C WP.....	4.92 oz	14	— <sup>2</sup>	— <sup>2</sup>	0.0 x	0.0 z'b'
+ RU22112-08B WG .....	0.28 oz					
74 RU22112-08C WP.....	9.84 oz	14	— <sup>2</sup>	— <sup>2</sup>	0.0 x	1.3 z'a'b'
75 RU22112-08B WG .....	0.28 oz	14	9.8 x-z'h'	1.3 u-w	6.3 s-x	28.8 k-p
76 Dewcure.....	4.0 fl oz	14	45.3 i-k	72.3 ab	72.5 a	31.3 i-o

278

(Continued)

Table 1B (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>2</sup>	Turf Area Infested (%) per Plot <sup>1</sup>			
			6 Aug.	15 Aug.	28 Aug.	9 Sept.
77 Chipco 26GT 2SC.....	4.0 fl oz	14	7.3 z'b'-i'	14.0 i-r	40.0 c-g	40.0 e-j
78 Heritage TL 0.8ME.....	1.0 fl oz	14	11.5 v-z'g'	2.3 r-w	5.0 t-x	11.3 u-z'a'
79 Heritage TL 0.8ME.....	2.0 fl oz	28	16.3 r-z'a'	7.0 p-w	6.3 s-x	3.8 z-z'b'
80 RU Program.....	—	VAR <sup>7</sup>	7.8 z'b'-i'	1.3 u-w	1.3 wx	3.8 z-z'b'
81 MOI-106.....	2.56 fl oz	Cur14 <sup>8</sup>	59.3 a-d	65.0 a-c	33.8 f-j	25.0 m-s
+ Sync 100XL.....	0.32 fl oz					
82 MOI-106.....	2.56 fl oz	Cur14 <sup>8</sup>	57.0 b-f	60.0 c	42.5 b-g	28.8 k-p
+ Daconil Ultrex 82.5WDG.....	1.8 oz					
+ Sync 100XL.....	0.32 fl oz					
83 MOI-106.....	2.56 fl oz	Cur14 <sup>8</sup>	30.0 m-o	19.0 g-o	22.5 j-o	26.3 l-r
+ Heritage 50WG.....	0.1 oz					
+ Sync 100XL.....	0.32 fl oz					
84 Untreated check.....	—	—	64.3 ab	62.5 a-c	46.3 b-e	50.0 a-e
85 Untreated check.....	—	—	65.5 a	72.0 ab	42.5 b-g	46.3 b-g
86 Untreated check.....	—	—	58.3 a-f	63.5 a-c	47.5 b-d	55.0 a-c
87 Untreated check.....	—	—	58.8 a-e	68.5 a-c	41.3 b-g	51.3 a-d
88 Untreated check.....	—	—	57.5 a-f	73.5 a	43.8 b-f	46.3 b-g
89 Untreated check.....	—	—	53.5 d-i	64.5 a-c	45.0 b-f	51.3 a-d
90 Untreated check.....	—	—	56.8 b-g	63.3 a-c	50.0 b-d	56.3 ab
91 Untreated check.....	—	—	63.3 a-c	65.8 a-c	51.3 bc	57.5 a
		INT <sup>9</sup>	DAT <sup>10</sup>	DAT	DAT	DAT
		7	1	10	23	35
		14	8	17	30	42
		21	1	10	23	35
		28	8	17	30	42

279

(Continued)

Table 1B (continued).

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- <sup>1</sup> 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).
- <sup>2</sup> Fungicides were applied on 3 June (all treatments except treatments 1 to 11, 50, 51 to 58, and 81 to 83), 10 June (7-day treatment and initiated treatment 50), 17 June (7- and 14-day treatments and initiated treatments 1 to 11 and 51 to 58), 24 June (7- and 21-day treatments), 1 July (7-, 14- and 28-day treatments and initiated treatments 81 to 83), 8 July (7-day treatment), 15 July (7-, 14-, and 21-day treatments and last application for treatments 1 to 11), 22 July (7-day treatment), 29 July (7-, 14-, and 28-day treatments), 5 August (7- and 21-day treatments), and 12 August (treatments 26, 71, and 80). Daconil Ultrex 82.5WDG was applied @ 2.75 oz/1,000 sq ft to treatments 1 to 11 and 50 on 3 June and to treatments 81 to 83 on 24 June to suppress brown patch prior to the initiation of these entries. Could not evaluate disease on 6 August for treatments 38 to 41, 73, and 74 and on 15 August for treatments 73 and 74 due to phytotoxicity (see Table 3C).
- <sup>3</sup> Alternation of fungicides on a 14-day schedule, where treatment 26 received Vitalonil 1.375L + Kestrel 1.3ME on 3 and 17 June, 29 July, and 12 August and Vitalonil 1.375L + Dovetail 3.74F on 1 and 15 July.
- <sup>4</sup> Treatments 45 to 47, 49, and 50 were applied to dry foliage and then immediately irrigated with 0.33 gal of water per 3 X 5 ft plot.
- <sup>5</sup> Treatments 51 to 58 were initiated on a curative basis on 17 June.
- <sup>6</sup> Alternation of fungicides on a 14-day schedule, where treatment 71 received Legacy B 3.1SC + Chipco Signature 80WG on 3 June, 1 and 29 July and Chipco Signature 80WG + Daconil Ultrex 82.5WG on 17 June, 15 July, and 12 August.
- <sup>7</sup> Variable spray schedule, where treatment 80 (Rutgers Program) consisted of Daconil Ultrex 82.5WDG (3.2 oz) on 3 June, Insignia 20WG (0.5 oz) on 17 June, ProStar 70W (2.2 oz) + Banner MAXX 1.3ME (0.5 fl oz) + Banol 6L (1.0 fl oz) on 1 July, Endorse 2.5W (4.0 oz) + 3336 4F (4.0 fl oz) + Subdue MAXX 2MC (1.0 fl oz) on 15 July, Chipco 26GT 2SC (4.0 fl oz) + Chipco Signature 80WG (4.0 oz) on 29 July, and Emerald 70WG (0.13 oz) + ProStar 70W (2.2 oz) on 12 August.
- <sup>8</sup> Treatments 81 to 83 were initiated on a curative basis on 1 July.
- <sup>9</sup> Spray interval in days.
- <sup>10</sup> Days after the last treatment.



Table 1C. Effect of fungicides and biorational products on brown patch on a colonial bentgrass fairway: Rutgers University, 2008.

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
1 RU192514D-08 EC .....	0.63 fl oz	14	1.0 f	1.0 h	6.8 b-g	18.8 e-o'
2 RU192514D-08 EC .....	1.26 fl oz	14	1.0 f	1.0 h	7.3 a-e	20.0 d-n
3 RU192514J-08 EC .....	0.196 fl oz	14	1.0 f	1.0 h	6.8 b-g	32.5 a-e
4 RU192514J-08 EC .....	0.393 fl oz	14	1.0 f	1.0 h	7.3 a-e	23.8 c-l
5 RU192514J-08 EC .....	0.785 fl oz	14	1.0 f	1.0 h	7.5 a-d	30.0 a-g
6 RU192514J-08 EC .....	1.57 fl oz	14	1.0 f	1.0 h	8.3 a	32.5 a-e
7 RU192514J-08 EC .....	0.393 fl oz	14	1.0 f	1.0 h	7.5 a-d	21.3 d-n
+ RU192514B-08 ME .....	0.503 fl oz					
8 RU192514J-08 EC .....	0.785 fl oz	14	1.0 f	1.0 h	7.5 a-d	11.3 k-r
+ RU192514B-08 ME .....	0.503 fl oz					
9 RU192514B-08 ME .....	1.01 fl oz	14	1.0 f	1.0 h	6.0 e-j	13.8 i-r
10 RU192514I-08 WG .....	0.12 oz	14	1.0 f	1.0 h	4.8 j-m	16.3 g-q
11 RU192514B-08ME .....	0.503 fl oz	14	1.0 f	1.0 h	6.8 b-g	16.3 g-q
12 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	6.5 c-h	15.0 h-r
13 Prostar 70W .....	2.2 oz	14	1.0 f	1.0 h	7.0 a-f	12.5 j-r
14 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	7.3 a-e	22.5d-n
+ T-Methyl 4.5SC .....	3.0 fl oz					
15 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	6.3 d-i	15.0 h-r
+ T-Methyl 4.5SC .....	4.0 fl oz					
16 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	5.8 f-k	21.3 d-n
+ Trinity 1.67SC .....	0.75 fl oz					
17 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	8.0 ab	10.0 l-r
+ Trinity 1.67SC .....	1.0 fl oz					
18 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	7.5 a-d	30.0 a-g
+ Iprodione Pro 2SC .....	3.0 fl oz					
19 Emerald 70WG .....	0.13 oz	14	1.0 f	1.0 h	7.0 a-f	27.5 b-i
+ Iprodione Pro 2SC .....	4.0 fl oz					
20 Trinity 1.67SC .....	1.0 fl oz	14	1.0 f	1.0 h	7.3 a-e	25.0 b-k
+ Iprodione Pro 2SC .....	2.0 fl oz					

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
21 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....3.0 fl oz		14	1.0 f	1.0 h	7.8 a-c	16.3 g-q
22 Trinity 1.67SC .....1.0 fl oz + Iprodione Pro 2SC .....4.0 fl oz		14	1.0 f	1.0 h	7.8 a-c	23.8 c-l
23 Curalan EG 50WG ..... 1.0 oz		14	1.0 f	1.0 h	5.5 g-l	10.0 l-r
24 Insignia 20WG ..... 0.5 oz		14	1.0 f	1.0 h	8.0 ab	1.3 r
25 Trinity 1.67SC .....1.0 fl oz		14	1.0 f	1.0 h	6.5 c-h	23.0 c-m
26 Vitalonil 1.375L.....6.0 fl oz + Kestrel 1.3ME .....1.0 fl oz / Vitalonil 1.375L.....6.0 fl oz + Dovetail 3.74F.....2.0 fl oz		14 <sup>6</sup>	1.0 f	2.9 d	4.0 mn	10.0 l-r
27 RU42116-08D WG ..... 0.2 oz		14	1.0 f	1.0 h	7.3 a-e	11.3 k-r
28 RU42116-08E WG ..... 0.2 oz		14	1.0 f	1.0 h	7.3 a-e	20.0 d-n
29 RU42116-08E WG ..... 0.25 oz		14	1.0 f	1.0 h	7.3 a-e	15.0 h-r
30 RU42116-08E WG ..... 0.3 oz		14	1.0 f	1.0 h	7.3 a-e	21.3 d-n
31 RU22112-08A SC.....0.26 fl oz		14	1.0 f	1.0 h	5.0 i-m	23.8 c-l
32 RU22112-08B WG ..... 0.18 oz		14	1.0 f	1.0 h	6.3 d-i	23.8 c-l
33 RU22112-08A SC.....0.26 fl oz + RU22112-08B WG ..... 0.18 oz		14	1.0 f	1.0 h	7.5 a-d	13.8 i-r
34 RU22112-08A SC.....0.52 fl oz		14	1.0 f	1.0 h	6.0 e-j	27.5 b-i
35 RU22112-08A SC.....1.04 fl oz		14	1.0 f	1.0 h	6.5 c-h	20.0 d-n
36 RU22112-08A SC.....2.08 fl oz		14	1.0 f	1.0 h	6.0 e-j	27.5 b-i
37 Endorse 2.5W ..... 4.0 oz		14	1.0 f	1.0 h	7.3 a-e	31.3 a-f
38 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....2.0 fl oz		14	1.5 d	2.0 g	5.5 g-l	8.8 m-r
39 Autograph 70WDG..... 4.57 oz + Kestrel 1.3ME .....2.0 fl oz + Pegasus HPX 6F .....3.6 fl oz		14	1.3 e	2.6 e	4.5 k-m	3.0 p-r

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
40	Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....2.0 fl oz	14	1.3 e	3.1 c	4.8 j-m	7.8 n-r
41	Chipco Signature 80WG ..... 4.0 oz + Banner MAXX 1.3ME.....2.0 fl oz + Daconil Weather Stik 6F .....3.6 fl oz	14	1.0 f	3.0 cd	4.3 l-n	1.5 qr
42	Legacy F 1.67SC .....1.0 fl oz	21	1.0 f	1.0 h	5.8 f-k	25.0 b-k
43	Trinity 1.67SC .....1.0 fl oz	21	1.0 f	1.0 h	6.8 b-g	25.0 b-k
44	Banner MAXX 1.3ME .....1.6 fl oz	14	1.0 f	2.3 f	5.0 i-m	28.8 b-h
45	A14912A 0.31GR ..... 64.0 oz	21 <sup>7</sup>	1.0 f	1.0 h	5.8 f-k	15.0 h-r
46	A14912C 0.31GR ..... 64.0 oz	21 <sup>7</sup>	1.0 f	1.0 h	6.8 b-g	17.5 f-p
47	EXC3949 0.28GR ..... 71.0 oz	21 <sup>7</sup>	1.0 f	1.0 h	8.3 a	26.3 b-j
48	Heritage TL 0.8ME .....2.0 fl oz	21	1.0 f	1.0 h	7.8 a-c	15.0 h-r
49	Compass G 0.157GR..... 64.0 oz	21 <sup>7</sup>	1.0 f	1.0 h	5.0 i-m	25.0 b-k
50	Fungicide X 1.3GR..... 76.0 oz	21 <sup>7</sup>	1.0 f	1.0 h	4.8 j-m	23.8 c-l
51	Chipco Triton 70WDG ..... 0.273 oz	Cur14 <sup>8</sup>	1.0 f	1.0 h	6.0 e-j	17.5 f-p
52	Legacy B 3.1SC .....0.5 fl oz	Cur14 <sup>8</sup>	1.0 f	1.0 h	7.3 a-e	27.5 b-i
53	Chipco Triton 70WDG ..... 0.273 oz + Primo 1EC.....0.125 fl oz	Cur14 <sup>8</sup>	1.3 e	1.0 h	6.0 e-j	17.5 f-p
54	Legacy B 3.1SC .....0.5 fl oz + Primo 1EC.....0.125 fl oz	Cur14 <sup>8</sup>	1.0 f	1.0 h	6.3 d-i	15.0 h-r
55	Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz	Cur14 <sup>8</sup>	1.0 f	1.0 h	6.5 c-h	25.0 b-k
56	Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz	Cur14 <sup>8</sup>	1.0 f	1.0 h	7.5 a-d	20.0 d-n
57	Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz	Cur14 <sup>8</sup>	1.3 e	1.0 h	7.8 a-c	12.5 j-r

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
58 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC .....0.125 fl oz		Cur14 <sup>8</sup>	1.3 e	1.1 h	7.0 a-f	11.3 k-r
59 Chipco Triton 70WDG ..... 0.273 oz		28	1.0 f	1.0 h	5.5 g-l	15.0 h-r
60 Legacy B 3.1SC .....0.5 fl oz		28	1.0 f	1.0 h	5.3 h-m	13.8 i-r
61 Chipco Triton 70WDG ..... 0.273 oz + Primo 1EC.....0.125 fl oz		28	1.5 d	1.0 h	5.0 i-m	10.3 k-r
62 Legacy B 3.1SC .....0.5 fl oz + Primo 1EC.....0.125 fl oz		28	1.0 f	1.0 h	5.8 f-k	8.0 n-r
63 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz		28	1.0 f	1.0 h	6.0 e-j	21.5 d-n
64 Legacy B 3.1 SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz		28	1.0 f	1.0 h	7.0 a-f	13.8 i-r
65 Chipco Triton 70WDG ..... 0.273 oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz		28	1.0 f	1.0 h	5.5 g-l	12.5 j-r
66 Legacy B 3.1SC .....0.5 fl oz + Chipco Signature 80WG ..... 4.0 oz + Primo 1EC.....0.125 fl oz		28	1.0 f	1.0 h	5.5 g-l	8.8 m-r
67 Legacy B 3.1SC .....0.4 fl oz		14	1.0 f	1.0 h	7.3 a-e	5.0 o-r
68 Legacy B 3.1SC .....0.55 fl oz		14	1.0 f	1.0 h	7.5 a-d	4.3 o-r
69 Legacy B 3.1SC .....0.75 fl oz		14	1.0 f	1.0 h	7.8 a-c	10.0 l-r
70 Legacy B 3.1SC .....1.1 fl oz		14	1.0 f	1.0 h	8.0 ab	17.5 f-p
71 Legacy B 3.1SC .....0.4 fl oz + Chipco Signature 80WG ..... 4.0 oz / Chipco Signature 80WG ..... 4.0 oz + Daconil Ultrex 82.5WG ..... 3.2 oz		14 <sup>9</sup>	1.0 f	1.0 h	7.3 a-e	18.8 e-o
72 CX3205 EC .....2.57 fl oz		7	1.0 f	1.0 h	5.0 i-m	26.3 b-j

284

(Continued)

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
73 RU22112-08C WP.....	4.92 oz					
+ RU22112-08B WG .....	0.28 oz	14	4.0 b	3.8 b	3.3 n	15.5 g-r
74 RU22112-08C WP.....	9.84 oz	14	4.5 a	4.5 a	2.0 o	10.0 l-r
75 RU22112-08B WG .....	0.28 oz	14	1.0 f	1.0 h	6.8 b-g	20.0 d-n
76 Dewcure.....	4.0 fl oz	14	2.0 c	1.0 h	5.0 i-m	18.8 e-o
77 Chipco 26GT 2SC.....	4.0 fl oz	14	1.0 f	1.0 h	6.8 b-g	31.3 a-f
78 Heritage TL 0.8ME .....	1.0 fl oz	14	1.0 f	1.0 h	6.8 b-g	22.5 d-n
79 Heritage TL 0.8ME .....	2.0 fl oz	28	1.0 f	1.0 h	6.0 e-j	43.8 a
80 RU Program .....	—	VAR <sup>10</sup>	1.0 f	1.0 h	8.3 a	26.3 b-j
81 MOI-106 .....	2.56 fl oz					
+ Sync 100XL.....	0.32 fl oz	Cur14 <sup>11</sup>	1.0 f	1.0 h	4.8 j-m	22.5 d-n
82 MOI-106 .....	2.56 fl oz					
+ Daconil Ultrex 82.5WDG.....	1.8 oz					
+ Sync 100XL.....	0.32 fl oz	Cur14 <sup>11</sup>	1.0 f	1.0 h	5.0 i-m	28.8 b-h
83 MOI-106 .....	2.56 fl oz					
+ Heritage 50WG .....	0.1 oz					
+ Sync 100XL.....	0.32 fl oz	Cur14 <sup>11</sup>	1.0 f	1.0 h	6.0 e-j	21.3 d-n
84 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	27.5 b-i
85 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	28.8 b-h
86 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	28.8 b-h
87 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	37.5 a-c
88 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	27.8 b-i
89 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	21.3 d-n
90 Untreated check .....	—	—	1.0 f	1.0 h	5.3 h-m	38.8 ab
91 Untreated check .....	—	—	1.0 f	1.0 h	4.8 j-m	38.8 ab

285

(Continued)

Table 1C (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) <sup>5</sup>	Phytotoxicity <sup>1,2</sup>		Turf Quality <sup>3</sup>	Yellow Tuft <sup>4</sup>
			14 July	6 Aug.	6 Aug.	9 Sept.
		INT <sup>12</sup>	DAT <sup>13</sup>	DAT	DAT	DAT
		7	6	1	1	35
		14	13	8	8	42
		21	20	1	1	35
		28	13	8	8	42

<sup>1</sup> 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).

<sup>2</sup> Phytotoxicity on a 1 to 5 scale, where 1 = no discoloration, 2 = slight foliar chlorosis or necrosis, 3 = moderate chlorosis or necrosis, 4 = severe chlorosis or necrosis, 5 = all turf dead.

<sup>3</sup> Turf quality on a 1 to 9 scale, where 9 = best turf quality and 5 = commercially acceptable quality.

<sup>4</sup> Percent turf area infested with yellow tuft, caused by *Sclerophthora macrospora*.

<sup>5</sup> Fungicides were applied on 3 June (all treatments except treatments 1 to 11, 50, 51 to 58, and 81 to 83), 10 June (7-day treatment and initiated treatment 50), 17 June (7- and 14-day treatments and initiated treatments 1 to 11 and 51 to 58), 24 June (7- and 21-day treatments), 1 July (7-, 14- and 28-day treatments and initiated treatments 81 to 83), 8 July (7-day treatment), 15 July (7-, 14-, and 21-day treatments and last application for treatments 1 to 11), 22 July (7-day treatment), 29 July (7-, 14-, and 28-day treatments), 5 August (7- and 21-day treatments), and 12 August (treatments 26, 71, and 80). Daconil Ultrex 82.5WDG was applied @ 2.75 oz/1,000 sq ft to treatments 1 to 11 and 50 on 3 June and to treatments 81 to 83 on 24 June to suppress brown patch prior to the initiation of these entries.

<sup>6</sup> Alternation of fungicides on a 14-day schedule, where treatment 26 received Vitalonil 1.375L + Kestrel 1.3ME on 3 and 17 June, 29 July, and 12 August and Vitalonil 1.375L + Dovetail 3.74F on 1 and 15 July.

<sup>7</sup> Treatments 45 to 47, 49, and 50 were applied to dry foliage and then immediately irrigated with 0.33 gal of water per 3 X 5 ft plot.

<sup>8</sup> Treatments 51 to 58 were initiated on a curative basis on 17 June.

<sup>9</sup> Alternation of fungicides on a 14-day schedule, where treatment 71 received Legacy B 3.1SC + Chipco Signature 80WG on 3 June, 1 and 29 July and Chipco Signature 80WG + Daconil Ultrex 82.5WG on 17 June, 15 July, and 12 August.

<sup>10</sup> Variable spray schedule, where treatment 80 (Rutgers Program) consisted of Daconil Ultrex 82.5WDG (3.2 oz) on 3 June, Insignia 20WG (0.5 oz) on 17 June, ProStar 70W (2.2 oz) + Banner MAXX 1.3ME (0.5 fl oz) + Banol 6L (1.0 fl oz) on 1 July, Endorse 2.5W (4.0 oz) + 3336 4F (4.0 fl oz) + Subdue MAXX 2MC (1.0 fl oz) on 15 July, Chipco 26GT 2SC (4.0 fl oz) + Chipco Signature 80WG (4.0 oz) on 29 July, and Emerald 70WG (0.13 oz) + ProStar 70W (2.2 oz) on 12 August.

<sup>11</sup> Treatments 81 to 83 were initiated on a curative basis on 1 July.

(Continued)

Table 1C (continued).

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<sup>12</sup> Spray interval in days.

<sup>13</sup> Days after the last treatment.



*Cooperating Agencies:* Rutgers, The State University of New Jersey, U.S. Department of Agriculture, and County Boards of Chosen Freeholders. Rutgers Cooperative Extension, a unit of the Rutgers New Jersey Agricultural Experiment Station, is an equal opportunity program provider and employer.