

2008 - 2009 Fungicide Report

**Department of Plant Pathology
Michigan State University**

**Dr. J. M. Vargas, Jr., Nancy Dykema, Ron Detweiler, Kevin Bishop, Eric Largent,
Michael Wandersee, Kyle Fischer, Kristen Dykema, Paul Giordano, and Liewei Yan**

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2008-2009 Snow Mold (*Typhula ishikariensis* and *T. incarnata*)

This corporation-sponsored snow mold fungicide field study was conducted during the fall and winter of 2008-2009 at the Treetops/Sylvan Resort in Gaylord, MI. Treatments were applied preventively to four replicate 6' x 9' creeping bentgrass (*Agrostis palustris*)/annual bluegrass (*Poa annua*) fairway plots on the dates indicated in Table 1. The turf was maintained at approximately ½" height of cut with industry standard level fertility applications made by the golf course personnel. Treatment applications were made as listed in Tables 1 and 2, some initially on 10/7/09, and most on 10/31/09. Liquid treatments were applied with a CO₂ backpack sprayer at a pressure of 38 psi and a spray volume of 96 GPA using a double-nozzle boom with 8002E flat fan Tee Jet nozzles, unless otherwise indicated. Granular products were pre-weighed and hand-applied.

The late fall-winter weather in the Gaylord, MI area was considered typical for a Michigan winter; with monthly average temperatures in the historic average range most of the time and precipitation towards the high side of average. Snow started falling in early to mid-November and continued through the winter and, with cool November temperatures, the ground snow cover remained from November, 2008 until the spring thaw in late March, 2009. The snow mold study was rated on April 2, 2009 following snow-cover melt-off. The plots were rated for percent plot area infected with snow mold, which included both gray snow mold (*Typhula ishikariensis* and *T. incarnata*) and some Microdochium patch (*Microdochium nivale*), and for turfgrass quality (turfgrass color and density.)

Disease pressure was moderately heavy this year, with the controls averaging approximately 59% disease (Table 1). Even under such pressure, many fungicide combinations provided excellent snow mold control averaged less than 3% disease including: Instrata, USF26019T/ Triton Flo, Disarm/Veranda, Triton Flo/Compass/Daconil Ultrex, Concert/Headway, Reserve/Compass, Chipco 26GT/Daconil Ultrex/PCNB (high rates), Disarm C (6 fl oz), Disarm C/Banner Maxx, QualiPro TM/C/QP Iprodione/QP Propiconazole, Tartan/Daconil Ultrex, Disarm SC, Endorse/Spectro/CX-30, and Disarm T. Application rates and application dates are provided in Table 1.

Many treatments provided very good turf quality. Quality data are provided in Table 2. Some phytotoxicity was observed, as yellowing of the turf, particularly in the plots that received 12 oz or more of PCNB.

Table 1. Treetops Snow Mold, 2008-9 Disease Rating**Rating Date:** April 2, 2009.**Rating Scale:** Total percent plot area infected with snow mold (*Microdochium nivale*, *Typhula ishikariensis* and *T. incarnata*.)

	Treatment and Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean ^a	LSD ^b
12	Instrata 5.5 fl oz	10/7, 10/31	0	0	0	0.5	0.1	a
50	USF26019T 6 fl oz	31-Oct	0	0	0.5	0	0.1	a
50	Triton Flo 0.85 fl oz	31-Oct						
48	Disarm C 3 fl oz	31-Oct	0.25	0.5	0	0.25	0.3	a
48	Veranda 0.88 oz	31-Oct						
51	Triton Flo 0.85 fl oz	31-Oct	0	0.5	0	0.5	0.3	a
51	Compass 0.25 oz	31-Oct						
51	Daconil Ultrex 5 oz	31-Oct						
13	Concert 8.25 fl oz + Headway 1.5 fl oz	31-Oct	0	0	0.25	1	0.3	a
35	USF26019T 4 fl oz	31-Oct	0.5	0.25	0.5	0.5	0.4	ab
35	Triton Flo 0.85 fl oz	31-Oct						
52	Reserve 4.8 SC 5.4 fl oz	31-Oct	0	2	0	0	0.5	ab
52	Compass 0.25 oz	31-Oct						
3	26/36 4 fl oz	31-Oct	1	0.25	0	1	0.6	ab
3	Spectro 5.75 oz	31-Oct						
3	CX-30 2 fl oz	31-Oct						
41	Chipco 26GT 8 fl oz	31-Oct	0	0	0.25	2	0.6	ab
41	Daconil Ultrex 3.2 oz	31-Oct						
41	PCNB 12 fl oz	31-Oct						
49	USF26019T 5 fl oz	31-Oct	0.25	0.25	0	3	0.9	ab
49	Triton Flo 0.85 fl oz	31-Oct						
44	Disarm C 6 fl oz	31-Oct	3	0	0.5	0.5	1.0	ab
46	Disarm C 3 fl oz	31-Oct	3	0.25	0.25	0.5	1.0	ab
46	Banner Maxx 3 fl oz	31-Oct						

56	QP TM/C 6 oz	31-Oct	1	1	0	2	1.0	ab
56	QP Iprodione 4 fl oz	31-Oct						
56	QP Propiconazole 2 fl oz	31-Oct						
53	Tartan 2 fl oz	31-Oct	0.25	0	0	5	1.3	abc
53	Daconil Ultrex 5 oz	31-Oct						
63	Endorse 4 oz	31-Oct	0	0.25	0	5	1.3	abc
63	Spectro 5.75 oz	31-Oct						
63	CX-30 2 oz	31-Oct						
11	Instrata 11 fl oz	31-Oct	0	0	0	7	1.8	a-d
42	Disarm 480 SC 0.36 fl oz	31-Oct	5	0.5	0.5	1	1.8	a-d
45	Disarm T (ARY 0534-002) 0.6 fl oz	31-Oct	7	3	0.25	0.25	2.6	a-d
55A	QP TM/C 6 oz	7-Oct	7	0.5	2	2	2.9	a-d
55B	QP Iprodione 4 fl oz	31-Oct						
55B	QP Propiconazole 2 fl oz	31-Oct						
47	Disarm C 3 fl oz	31-Oct	2	10	0	0.5	3.1	a-e
47	Chipco 26GT 4 fl oz	31-Oct						
1	Endorse 4 oz	31-Oct	7	0.25	2	5	3.6	a-e
1	CX-30 2 fl oz	31-Oct						
6	26/36 4 fl oz	31-Oct	15	1	0.5	2	4.6	a-e
6	CX-28 1.2 oz	31-Oct						
57	QP Iprodione 4 fl oz	31-Oct	15	1	3	10	7.3	a-g
57	QP Propiconazole 2 fl oz	31-Oct						
9	Trinity 1.5 fl oz + Insignia 0.5 oz + Chlorothalonil 5 oz	31-Oct	12	1	12	7	8.0	a-g
10	Trinity 1.5 fl oz + Insignia 0.5 oz + Iprodione Pro 4 fl oz	31-Oct	7	5	0.25	20	8.1	a-g
40	Chipco 26GT 4 fl oz	31-Oct	0.25	25	3	10	9.6	a-h
40	Daconil Ultrex 3.2	31-Oct						
40	PCNB 6 fl oz	31-Oct						
21	Trinity 1 fl oz	10/7, 10/31	40	3	0	1	11.0	a-i
21	Iprodione Pro 3 fl oz	10/7, 10/31						
22	Trinity 1 fl oz	10/7, 10/31	35	3	1	15	13.5	a-j

22	Iprodione Pro 4 fl oz	10/7, 10/31							
58	QP Iprodione 4 fl oz	31-Oct	20	10	0	35	16.3	a-k	
58	QP Chlorothalonil 5.5 oz	31-Oct							
7A	Curalan 1 oz + Chlorothalonil 3.2 oz	26-Sep	15	2	2	60	19.8	c-l	
7B	Insignia 0.5 oz + Trinity 1 oz	7-Nov							
5	26/36 4 fl oz	31-Oct	30	25	0.25	25	20.1	d-l	
5	Endorse 4 oz	31-Oct							
5	CX-30 1 fl oz	31-Oct							
8A	Curalan 1oz + Chlorothalonil 3.2 oz	26-Sep	25	20	2	40	21.8	e-m	
8B	Trinity 1.5 fl oz + Chlorothalonil 5 oz	7-Nov							
16	Emerald 0.13 oz	10/7, 10/31	20	20	1	60	25.3	g-m	
16	Trinity 0.75 fl oz	10/7, 10/31							
4	26/36 4 fl oz	31-Oct	25	50	25	10	27.5	h-n	
4	CX-30 2 fl oz	31-Oct							
17	Emerald 0.13 oz	10/7, 10/31	30	55	12	20	29.3	i-o	
17	Trinity 1 fl oz	10/7, 10/31							
20	Trinity 1 fl oz	10/7, 10/31	40	40	0	40	30.0	j-o	
20	Iprodione Pro 2 fl oz	10/7, 10/31							
43	Disarm G 4.5 lbs	31-Oct	65	35	20	25	36.3	l-o	
19	Emerald 0.13 oz	10/7, 10/31	70	50	0.25	35	38.8	m-p	
19	Iprodione Pro 4 fl oz	10/7, 10/31							
14	Emerald 0.13 oz	10/7, 10/31	80	60	15	25	45.0	n-q	
14	T-Methyl 3 fl oz	10/7, 10/31							
18	Emerald 0.13 oz	10/7, 10/31	60	65	15	40	45.0	n-q	
18	Iprodione Pro 3 fl oz	10/7, 10/31							
2	26/36 4 fl oz	31-Oct	85	60	1	35	45.3	n-q	
2	Endorse 4 oz	31-Oct							
2	Spotrete 6 oz	31-Oct							
15	Emerald 0.13 oz	10/7, 10/31	85	90	15	35	56.3	pqr	
15	T-Methyl 4 fl oz	10/7, 10/31							

59	Control		35	85	40	75	58.8	qr
23	Curalan 1 oz	10/7, 10/31	90	75	10	90	66.3	r

^a Mean of 4 replications.

^b Treatment means followed by the same letter do not significantly differ (LSD, $p=0.05$).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Treetops Snow Mold - 2008-2009

Table 2. Treetops Snow Mold 2008-9, Quality Rating

Rating Date: April 2, 2009.

Rating Scale: Quality 1-10. 1=poor, 7=acceptable, 10=excellent.

	Treatment and Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean ^a	LSD ^b
50	USF26019T 6 fl oz	31-Oct	8	8	8	8	8.0	ab
50	Triton Flo 0.85 fl oz	31-Oct						
51	Triton Flo 0.85 fl oz	31-Oct	8	7	8	8	7.8	abc
51	Compass 0.25 oz	31-Oct						
51	Daconil Ultrex 5 oz	31-Oct						
52	Reserve 4.8 SC 5.4 fl oz	31-Oct	7	8	8	8	7.8	abc
52	Compass 0.25 oz	31-Oct						
53	Tartan 2 fl oz	31-Oct	8	8	7	8	7.8	abc
53	Daconil Ultrex 5 oz	31-Oct						
35	USF26019T 4 fl oz	31-Oct	7	8	8	7	7.5	a-d
35	Triton Flo 0.85 fl oz	31-Oct						
49	USF26019T 5 fl oz	31-Oct	8	8	7	7	7.5	a-d
49	Triton Flo 0.85 fl oz	31-Oct						
44	Disarm C 6 fl oz	31-Oct	7	8	7	7	7.3	a-e
48	Disarm C 3 fl oz	31-Oct	8	7	7	7	7.3	a-e
48	Veranda 0.88 oz	31-Oct						
3	26/36 4 fl oz	31-Oct	7	7	7	7	7.0	b-f
3	Spectro 5.75 oz	31-Oct						
3	CX-30 2 fl oz	31-Oct						

11	Instrata 11 fl oz	31-Oct	7	7	7	7	7.0	b-f
12	Instrata 5.5 fl oz	10/7, 10/31	7	7	7	7	7.0	b-f
13	Concert 8.25 fl oz + Headway 1.5 fl oz	31-Oct	7	7	7	7	7.0	b-f
46	Disarm C 3 fl oz	31-Oct	6	8	7	7	7.0	b-f
46	Banner Maxx 3 fl oz	31-Oct						
56	QP TM/C 6 oz	31-Oct	7	7	7	7	7.0	b-f
56	QP Iprodione 4 fl oz	31-Oct						
56	QP Propiconazole 2 fl oz	31-Oct						
63	Endorse 4 oz	31-Oct	7	7	7	7	7.0	b-f
63	Spectro 5.75 oz	31-Oct						
63	CX-30 2 oz	31-Oct						
42	Disarm 480 SC 0.36 fl oz	31-Oct	6	7	7	7	6.8	b-g
55A	QP TM/C 6 oz	7-Oct	6	7	7	7	6.8	b-g
55B	QP Iprodione 4 fl oz	31-Oct						
55B	QP Propiconazole 2 fl oz	31-Oct						
45	Disarm T (ARY 0534-002) 0.6 fl oz	31-Oct	5	7	7	7	6.5	c-h
47	Disarm C 3 fl oz	31-Oct	7	5	7	7	6.5	c-h
47	Chipco 26GT 4 fl oz	31-Oct						
6	26/36 4 fl oz	31-Oct	5	7	7	6	6.3	d-i
6	CX-28 1.2 oz	31-Oct						
10	Trinity 1.5 fl oz + Insignia 0.5 oz + Iprodione Pro 4 fl oz	31-Oct	6	6	8	5	6.3	d-i
40	Chipco 26GT 4 fl oz	31-Oct	7	5	7	6	6.3	d-i
40	Daconil Ultrex 3.2	31-Oct						
40	PCNB 6 fl oz	31-Oct						
41	Chipco 26GT 8 fl oz	31-Oct	6	6	6	7	6.3	d-i
41	Daconil Ultrex 3.2 oz	31-Oct						
41	PCNB 12 fl oz	31-Oct						
57	QP Iprodione 4 fl oz	31-Oct	5	7	7	6	6.3	d-i
57	QP Propiconazole 2 fl oz	31-Oct						
1	Endorse 4 oz	31-Oct	5	7	6	6	6.0	e-j

1	CX-30 2 fl oz	31-Oct						
9	Trinity 1.5 fl oz + Insignia 0.5 oz + Chlorothalonil 5 oz	31-Oct	6	7	6	5	6.0	e-j
21	Trinity 1 fl oz	10/7, 10/31	3	6	7	7	5.8	f-k
21	Iprodione Pro 3 fl oz	10/7, 10/31						
5	26/36 4 fl oz	31-Oct	5	5	7	5	5.5	g-l
5	Endorse 4 oz	31-Oct						
5	CX-30 1 fl oz	31-Oct						
7A	Curalan 1 oz + Chlorothalonil 3.2 oz	26-Sep	5	7	7	3	5.5	g-l
7B	Insignia 0.5 oz + Trinity 1 oz	7-Nov						
22	Trinity 1 fl oz	10/7, 10/31	3	7	7	5	5.5	g-l
22	Iprodione Pro 4 fl oz	10/7, 10/31						
58	QP Iprodione 4 fl oz	31-Oct	5	6	7	4	5.5	g-l
58	QP Chlorothalonil 5.5 oz	31-Oct						
8A	Curalan 1oz + Chlorothalonil 3.2 oz	26-Sep	5	5	7	3	5.0	i-n
8B	Trinity 1.5 fl oz + Chlorothalonil 5 oz	7-Nov						
16	Emerald 0.13 oz	10/7, 10/31	5	5	7	3	5.0	i-n
16	Trinity 0.75 fl oz	10/7, 10/31						
4	26/36 4 fl oz	31-Oct	4	4	5	6	4.8	j-n
4	CX-30 2 fl oz	31-Oct						
17	Emerald 0.13 oz	10/7, 10/31	5	3	5	5	4.5	k-o
17	Trinity 1 fl oz	10/7, 10/31						
20	Trinity 1 fl oz	10/7, 10/31	3	4	7	4	4.5	k-o
20	Iprodione Pro 2 fl oz	10/7, 10/31						
19	Emerald 0.13 oz	10/7, 10/31	2	3	7	4	4.0	m-q
19	Iprodione Pro 4 fl oz	10/7, 10/31						
43	Disarm G 4.5 lbs	31-Oct	2	4	5	5	4.0	m-q
2	26/36 4 fl oz	31-Oct	1	3	7	4	3.8	n-r
2	Endorse 4 oz	31-Oct						
2	Spotrete 6 oz	31-Oct						
14	Emerald 0.13 oz	10/7, 10/31	2	3	5	5	3.8	n-r

14	T-Methyl 3 fl oz	10/7, 10/31							
18	Emerald 0.13 oz	10/7, 10/31	3	2	5	3	3.3	o-s	
18	Iprodione Pro 3 fl oz	10/7, 10/31							
15	Emerald 0.13 oz	10/7, 10/31	1	2	5	4	3.0	p-s	
15	T-Methyl 4 fl oz	10/7, 10/31							
59	Control		4	2	3	2	2.8	qrs	
23	Curalan 1 oz	10/7, 10/31	1	2	5	1	2.3	s	

^a Mean of 4 replications.

^b Treatment means followed by the same letter do not significantly differ (LSD, $p=0.05$).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

**2008 – 2009 Fungicide Report [Anthracnose]
Department of Plant Pathology
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Anthracnose (Colletotrichum cereale), 2009
Crown Rot Anthracnose Study

A crown rot anthracnose study was set up on an annual bluegrass green at the Hancock Turfgrass Research Center, East Lansing, MI. The study was set up in a randomized complete block design with 4 replicates of each treatment. Plots measured 2' x 6' with 1' alleys. Treatments were applied preventively using a CO₂ backpack sprayer at 42 PSI and 96 GPA, unless listed otherwise in Tables 3-4, with a single 8002E Tee Jet flat fan nozzle. Granular treatments were pre-weighed and applied by hand. The annual bluegrass study area was inoculated with *Colletotrichum cereale* grown on sand/cornmeal using a drop spreader on 6/1, 6/25, and 7/8. Plots were fertilized at a rate of 0.5 lbs N/1000 ft²/month using Country Club 18-4-12. The entire study area was treated with Emerald at 0.13 oz/1000 ft² for the control of dollar spot on 6/25. All treatments were applied beginning on 6/16/09. Subsequent applications of the treatments on a 7 day interval were made on 7/1, 7/14, 7/21, 7/29, 8/6, 8/12, and 8/19. The 14 day interval treatments were reapplied on 7/1, 7/14, 7/29, and 8/12, and the 21 day interval treatments on 7/1, 7/21, and 8/12. For treatments that were applied on an alternating schedule, application dates are provided in Tables 5-6. Plots were rated by visual estimation of percent area infected with crown rotting anthracnose (Table 3). Quality ratings were taken using a 1-10 scale where 1 = poor, 7 = acceptable, and 10 = excellent turf quality (Table 4). Data were analyzed using ANOVA and means separated by LSD (p=0.05).

Crown rot anthracnose began to develop in the study area in July and good disease pressure continued into August. By mid-August, the untreated control plots reached their season high average disease level maximum of 58%, after which time, disease pressure steadily declined in all treatments and the untreated controls. Many of the treatments tested this year were tank mix applications, program-type applications where several products were applied at various timings throughout the disease season, alternating combinations, as well as traditional spray or granular applications. Every product we tested provided statistically significant disease control compared to the untreated control plots at some point of the disease test. However, many of these treatments still had disease levels that were considerably higher than would be acceptable under current golf standards. In addition, disease levels among the four replications of this study were somewhat variable, leading to a lack of statistical separation among many of the treatments. Many products tested (including stand alone products, combinations, alternations, and programs) provided good disease control (Table 3.)

Some of the top-performing products included: Interface, a weekly Floratine program with several products tank-mixed and two products used in alternation, Signature in combination with Triton Flo, and Reserve, Reserve (3.6 fl oz/1000 ft²), Tartan and Instrata. All of these treatments and combinations held disease levels to an average of less than 10% for the entire duration of the study. By the mid-August rating (8/16/09), when disease pressure reached its maximum level, all treatments showed an increase in disease level. Eagle, Disarm C, and Concert were also among the top-performing products throughout most of the study period.

Since the study area was treated in a manner conducive to disease development, overall turfgrass quality ratings, in general, were lower than would be considered acceptable according to industry standards. However, several products did result in good to superior turfgrass quality, even under less than ideal growing conditions. Some of these products include Tartan, Instrata, Interface, Signature/Triton Flo combination, Disarm C, and Reserve, to name a few (see Table 4.)

Table 3. Crown rot anthracnose, 2009

Location: Hancock Turfgrass Research Center, East Lansing, MI.

Rating Type: Percent plot area infected with crown rot anthracnose.

Rating Date				7/24/2009		7/29/2009		8/4/2009		8/11/2009		8/16/2009		
Trt	Treatment	Rate	Unit	Appl	Code	Code	Code	Code	Code	Code	Code	Code	Code	
No.	Name	Rate	Unit	Code	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
23	Astron	1.5	fl oz/1000 ft2	7 days	0.1	h	1.0	l-o	1.5	i-n	0.3	d	1.6	y
23	Echo Ultimate	2	oz/1000 ft2	7 days										
23	Knife Plus	1	fl oz/1000 ft2	7 days										
23	PK Fight	2	fl oz/1000 ft2	7 days										
23	Power 6-12-3	5	fl oz/1000 ft2	7 days										
23	Power C3 23-0-0	4.5	fl oz/1000 ft2	7 days										
23A	Protesyn	3	fl oz/1000 ft2	7 days ALT ^c										
23B	Floradox Pro	3	fl oz/1000 ft2	7 days ALT										
57	Interface	7	fl oz/1000 ft2	14 days	0.0	h	0.0	o	0.3	mn	0.3	d	2.5	wxy
54	Interface	4	fl oz/1000 ft2	14 days	0.0	h	0.0	o	2.0	i-n	1.3	d	3.3	v-y
53	Triton Flo	0.5	fl oz/1000 ft2	14 days	0.0	h	0.0	o	3.8	g-n	1.8	d	4.5	u-y
53	Chipco Signature	4	oz/1000 ft2	14 days										
50	Legacy F	1.01	fl oz/1000 ft2	14 days	1.3	d-h	3.3	h-o	4.5	f-n	1.3	d	6.0	t-y
50	Chipco Signature	4	oz/1000 ft2	14 days										
56	Interface	6	fl oz/1000 ft2	14 days	0.0	h	1.5	j-o	2.8	h-n	1.0	d	6.3	s-y
55	Interface	5	fl oz/1000 ft2	14 days	0.1	h	0.1	no	2.3	h-n	2.2	cd	6.9	s-y
28A	Triton Flo	0.5	fl oz/1000 ft2	14 days	0.0	h	0.8	l-o	2.6	h-n	1.8	d	7.5	r-y

28A	Chipco Signature	4	oz/1000 ft2	14 days ALT ^d										
28B	Chipco Signature	4	oz/1000 ft2	14 days										
28B	Daconil Ultrex	3.2	oz/1000 ft2	14 days										
28B	Primo	0.13	fl oz/1000 ft2	14 days										
39	Legacy G	1.1	fl oz/1000 ft2	14 days	1.3	d-h	0.8	l-o	1.5	i-n	2.5	bcd	7.5	r-y
39	Chipco Signature	3.93	oz/1000 ft2	14 days										
31	Reserve 4.8 SC	3.6	fl oz/1000 ft2	14 days	0.0	h	0.9	l-o	2.5	h-n	0.5	d	7.5	r-y
29	Reserve 4.8 SC	3.2	fl oz/1000 ft2	14 days	0.0	h	0.0	o	0.0	n	0.0	d	7.8	r-y
29	Chipco Signature	4	oz/1000 ft2	14 days										
26	Triton Flo	1	fl oz/1000 ft2	14 days	0.1	h	2.0	i-o	5.0	e-n	4.5	bcd	7.8	r-y
38	Legacy G	2.04	fl oz/1000 ft2	14 days	0.0	h	0.0	o	0.1	n	0.8	d	8.0	r-y
59	Tartan	2	fl oz/1000 ft2	14 days	1.3	d-h	0.4	mno	0.5	lmn	0.8	d	8.3	r-y
58	Instrata	9.3	fl oz/1000 ft2	14 days	0.0	h	5.0	f-o	2.5	h-n	3.8	bcd	9.0	q-y
33	Reserve 4.8 SC	2.8	fl oz/1000 ft2	14 days	0.0	h	0.1	no	1.8	i-n	3.3	bcd	10.0	p-y
48	Eagle 20EW	1.2	fl oz/1000 ft2	14 days	0.0	h	0.5	mno	2.5	h-n	2.5	bcd	10.5	o-y
34	Reserve 4.8 SC	4.5	fl oz/1000 ft2	14 days	0.0	h	0.0	o	0.8	k-n	0.3	d	11.8	m-y
30	Reserve 4.8 SC	3.2	fl oz/1000 ft2	14 days	0.0	h	1.8	j-o	1.4	i-n	1.0	d	12.5	l-y
44	Disarm C	4.4	fl oz/1000 ft2	14 days	1.3	d-h	0.4	mno	1.8	i-n	1.8	d	13.0	k-y
25	Triton Flo	0.75	fl oz/1000 ft2	14 days	0.8	fgh	2.6	h-o	6.6	d-n	5.3	bcd	13.0	k-y
36	Legacy G	1.1	fl oz/1000 ft2	14 days	0.1	h	2.0	i-o	1.1	j-n	1.9	d	14.3	j-x
18	A13703 G	0.5	fl oz/1000 ft2	14 days	0.6	gh	2.5	h-o	5.8	d-n	4.5	bcd	15.0	i-w
65	Concert	4.5	fl oz/1000 ft2	14 days	1.0	d-h	3.3	h-o	4.0	g-n	2.8	bcd	15.0	i-w
37	Legacy G	1.57	fl oz/1000 ft2	14 days	0.0	h	0.3	mno	1.0	j-n	0.3	d	15.2	i-v
24	Triton Flo	0.5	fl oz/1000 ft2	14 days	0.5	gh	2.6	h-o	3.8	g-n	5.5	bcd	15.5	i-v
62	Insignia	0.7	oz/1000 ft2	14 days	0.0	h	0.8	l-o	8.5	c-n	7.5	bcd	16.3	h-u
62	Trinity	1	fl oz/1000 ft2	14 days										
46	Disarm M	1	fl oz/1000 ft2	14 days	0.0	h	2.8	h-o	3.8	g-n	2.3	cd	16.3	h-u
49	Daconil Ultrex	6	lb ai/a	14 days	2.5	c-h	4.5	f-o	5.8	d-n	9.3	bcd	16.3	h-u
10	A6780 L	1	fl oz/1000 ft2	14 days	2.1	d-h	3.3	h-o	8.8	c-n	9.5	bcd	16.8	g-u
35	Legacy G	0.63	fl oz/1000 ft2	14 days	3.6	b-g	5.3	f-o	6.4	d-n	4.5	bcd	17.5	f-t
14	A17595 A	1.7	fl oz/1000 ft2	14 days	3.8	b-g	10.0	c-g	13.8	b-h	13.8	bcd	18.8	e-s
32	Concert	5	oz/1000 ft2	14 days	2.0	d-h	4.5	f-o	8.1	c-n	8.5	bcd	18.8	e-s
16	A17601 A	1.61	fl oz/1000 ft2	14 days	0.1	h	2.0	i-o	7.8	c-n	7.8	bcd	18.8	e-s
45	Disarm M	0.5	fl oz/1000 ft2	14 days	1.8	d-h	5.0	f-o	12.5	b-j	7.0	bcd	20.0	d-r
40	Instrata	4	fl oz/1000 ft2	14 days	1.8	d-h	3.3	h-o	8.0	c-n	4.0	bcd	20.0	d-r

60	Iprodione Pro	5	fl oz/1000 ft2	14 days	1.0	d-h	3.8	g-o	12.3	b-k	8.5	bcd	21.3	d-q
20	A8122 B	0.31	fl oz/1000 ft2	14 days	0.9	e-h	3.1	h-o	10.6	c-n	9.5	bcd	21.3	d-q
66	Concert	5.4	fl oz/1000 ft2	14 days	6.8	ab	6.3	d-o	8.8	c-n	6.8	bcd	22.5	c-p
17	A13703 G	0.32	fl oz/1000 ft2	14 days	2.5	c-h	6.6	d-m	11.3	c-n	11.3	bcd	23.0	c-o
11	A6780 L	1.5	fl oz/1000 ft2	14 days	1.6	d-h	5.3	f-o	11.5	b-n	8.5	bcd	23.8	c-n
43	Disarm 480SC	0.36	fl oz/1000 ft2	14 days	1.0	d-h	2.8	h-o	4.5	f-n	6.8	bcd	25.0	b-l
13	A16841 A	0.49	fl oz/1000 ft2	14 days	0.5	gh	6.3	d-o	12.8	b-i	12.8	bcd	25.0	b-l
15	A17601 A	0.81	fl oz/1000 ft2	14 days	1.0	d-h	1.3	k-o	7.8	c-n	6.8	bcd	26.3	b-j
63	Honor	1.1	oz/1000 ft2	14 days	1.3	d-h	6.5	d-n	12.0	b-l	13.8	bcd	26.3	b-j
47	Veranda 11.25%	0.9	oz/1000 ft2	14 days	1.8	d-h	5.8	e-o	16.3	b-e	15.5	bcd	28.8	b-h
12	A16841 A	0.25	fl oz/1000 ft2	14 days	4.0	b-f	7.1	d-l	11.8	b-m	11.5	bcd	28.8	b-h
61	Trinity	1	fl oz/1000 ft2	14 days	6.3	b	10.8	c-f	11.5	b-n	16.3	bcd	28.8	b-h
27	Banner Maxx	2	fl oz/1000 ft2	14 days	1.5	d-h	8.3	c-i	18.8	bc	9.5	bcd	30.0	b-f
19	A8122 B	0.16	fl oz/1000 ft2	14 days	2.8	c-h	7.8	c-j	11.5	b-n	8.3	bcd	30.0	b-f
52	Legacy F	1.01	fl oz/1000 ft2	14 days	0.8	fgh	4.5	f-o	10.0	c-n	12.5	bcd	30.0	b-f
42	Tourney	0.37	oz/1000 ft2	14 days	1.8	d-h	6.3	d-o	12.5	b-j	9.3	bcd	31.3	b-e
21	A14212 C	1.5	fl oz/1000 ft2	14 days	1.0	d-h	5.8	e-o	12.0	b-l	12.5	bcd	34.0	bc
41	Tourney	0.28	oz/1000 ft2	14 days	5.5	bc	13.5	bc	15.0	b-g	19.3	b	35.0	bc
67	Untreated Control				9.8	a	25.0	a	32.5	a	40.0	a	57.5	a

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c Treatments applied on a 7 day alternating schedule with part A applied on 6/16 and 7/14, and part B on 7/1, 7/29, and 8/12.

^d Treatments applied on a 14 day alternating schedule with part A applied on 6/16, 7/14, and 8/12, and part B on 7/1 and 7/29.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 4. Crown rot anthracnose, 2009

Location: Hancock Turfgrass Research Center, East Lansing, MI.

Rating Type: Turfgrass quality.

Rating Scale: 1 – 10, where 1=poor, 7=acceptable, and 10=excellent.

Rating Date					7/25/2009		8/4/2009		8/12/2009	
Trt	Treatment		Rate	Application						
No.	Name	Rate	Unit	Interval	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
10	A6780 L	1	fl oz/1000 ft ²	14 days	6.8	e-h	6.8	d-h	6.0	b-h
11	A6780 L	1.5	fl oz/1000 ft ²	14 days	7.0	d-g	6.5	e-i	4.7	fgh
13	A16841 A	0.49	fl oz/1000 ft ²	14 days	6.8	e-h	6.0	g-k	6.0	b-h
12	A16841 A	0.25	fl oz/1000 ft ²	14 days	6.8	e-h	6.0	g-k	5.5	c-h
14	A17595 A	1.7	fl oz/1000 ft ²	14 days	7.3	c-f	6.8	d-h	6.5	a-f
15	A17601 A	0.81	fl oz/1000 ft ²	14 days	7.0	d-g	6.8	d-h	6.0	b-h
16	A17601 A	1.61	fl oz/1000 ft ²	14 days	7.0	d-g	6.5	e-i	6.5	a-f
17	A13703 G	0.32	fl oz/1000 ft ²	14 days	6.8	e-h	6.8	d-h	6.3	a-g
18	A13703 G	0.5	fl oz/1000 ft ²	14 days	6.8	e-h	7.0	c-g	6.5	a-f
19	A8122 B	0.16	fl oz/1000 ft ²	14 days	6.5	f-i	6.5	e-i	5.8	b-h
20	A8122 B	0.31	fl oz/1000 ft ²	14 days	6.8	e-h	6.5	e-i	5.5	c-h
21	A14212 C	1.5	fl oz/1000 ft ²	14 days	6.0	hij	6.0	g-k	6.0	b-h
23	Astron	1.5	fl oz/1000 ft ²	7 days	9.0	a	8.5	a	8.0	a
23	Echo Ultimate	2	oz/1000 ft ²	7 days						
23	Knife Plus	1	fl oz/1000 ft ²	7 days						
23	PK Fight	2	fl oz/1000 ft ²	7 days						
23	Power 6-12-3	5	fl oz/1000 ft ²	7 days						
23	Power C3 23-0-0	4.5	fl oz/1000 ft ²	7 days						
23A	Protesyn	3	fl oz/1000 ft ²	7 days ALT ^c						
23B	Floradox Pro	3	fl oz/1000 ft ²	7 days ALT						
24	Triton Flo	0.5	fl oz/1000 ft ²	14 days	7.0	d-g	7.0	c-g	5.8	b-h
25	Triton Flo	0.75	fl oz/1000 ft ²	14 days	7.5	cde	7.0	c-g	6.0	b-h
26	Triton Flo	1	fl oz/1000 ft ²	14 days	7.0	d-g	6.8	d-h	6.8	a-e
27	Banner Maxx	2	fl oz/1000 ft ²	14 days	7.0	d-g	5.8	h-k	5.5	c-h
28A	Triton Flo	0.5	fl oz/1000 ft ²	14 days	7.5	cde	7.0	c-g	6.5	a-f
28A	Chipco Signature	4	oz/1000 ft ²	14 days ALT ^d						
28B	Chipco Signature	4	oz/1000 ft ²	14 days						
28B	Daconil Ultrex	3.2	oz/1000 ft ²	14 days						

28B	Primo	0.13	fl oz/1000 ft ²	14 days ALT						
29	Reserve 4.8 SC	3.2	fl oz/1000 ft ²	14 days	8.0	bc	7.8	a-d	6.5	a-f
29	Chipco Signature	4	oz/1000 ft ²	14 days						
30	Reserve 4.8 SC	3.2	fl oz/1000 ft ²	14 days	7.5	cde	7.5	a-e	6.5	a-f
31	Reserve 4.8 SC	3.6	fl oz/1000 ft ²	14 days	7.3	c-f	7.3	b-f	6.5	a-f
32	Concert	5	oz/1000 ft ²	14 days	6.8	e-h	6.0	g-k	5.8	b-h
33	Reserve 4.8 SC	2.8	fl oz/1000 ft ²	14 days	7.5	cde	7.5	a-e	6.8	a-e
34	Reserve 4.8 SC	4.5	fl oz/1000 ft ²	14 days	7.8	bcd	8.0	abc	7.3	abc
35	Legacy G	0.63	fl oz/1000 ft ²	14 days	7.0	d-g	7.5	a-e	6.3	a-g
36	Legacy G	1.1	fl oz/1000 ft ²	14 days	7.0	d-g	7.3	b-f	6.0	b-h
37	Legacy G	1.57	fl oz/1000 ft ²	14 days	7.5	cde	7.8	a-d	6.5	a-f
38	Legacy G	2.04	fl oz/1000 ft ²	14 days	7.5	cde	7.8	a-d	6.5	a-f
39	Legacy G	1.1	fl oz/1000 ft ²	14 days	7.8	bcd	7.3	b-f	7.0	a-d
39	Chipco Signature	3.93	oz/1000 ft ²	14 days						
40	Instrata	4	fl oz/1000 ft ²	14 days	6.3	g-j	6.3	f-j	6.3	a-g
41	Tourney	0.28	oz/1000 ft ²	14 days	6.0	hij	5.5	ijk	5.3	d-h
42	Tourney	0.37	oz/1000 ft ²	14 days	6.5	f-i	5.5	ijk	4.8	fgh
43	Disarm 480SC	0.36	fl oz/1000 ft ²	14 days	6.8	e-h	6.8	d-h	6.0	b-h
44	Disarm C	4.4	fl oz/1000 ft ²	14 days	7.3	c-f	7.3	b-f	6.8	a-e
45	Disarm M	0.5	fl oz/1000 ft ²	14 days	6.8	e-h	6.5	e-i	6.3	a-g
46	Disarm M	1	fl oz/1000 ft ²	14 days	7.0	d-g	6.8	d-h	6.8	a-e
47	Veranda 11.25%	0.9	oz/1000 ft ²	14 days	6.8	e-h	6.5	e-i	5.5	c-h
48	Eagle 20EW	1.2	fl oz/1000 ft ²	14 days	7.0	d-g	7.0	c-g	6.3	a-g
49	Daconil Ultrex	6	lb ai/a	14 days	6.5	f-i	6.5	e-i	6.3	a-g
50	Legacy F	1.01	fl oz/1000 ft ²	14 days	7.5	cde	7.5	a-e	6.5	a-f
50	Chipco Signature	4	oz/1000 ft ²	14 days						
52	Legacy F	1.01	fl oz/1000 ft ²	14 days	6.5	f-i	6.3	f-j	5.8	b-h
53	Triton Flo	0.5	fl oz/1000 ft ²	14 days	7.8	bcd	7.5	a-e	7.0	a-d
53	Chipco Signature	4	oz/1000 ft ²	14 days						
54	Interface	4	fl oz/1000 ft ²	14 days	8.5	ab	8.0	abc	7.3	abc
55	Interface	5	fl oz/1000 ft ²	14 days	7.8	bcd	8.0	abc	7.0	a-d
56	Interface	6	fl oz/1000 ft ²	14 days	8.5	ab	8.0	abc	7.3	abc
57	Interface	7	fl oz/1000 ft ²	14 days	7.0	d-g	8.3	ab	7.5	ab
58	Instrata	9.3	fl oz/1000 ft ²	14 days	6.0	hij	5.5	ijk	7.0	a-d
59	Tartan	2	fl oz/1000 ft ²	14 days	7.3	c-f	7.5	a-e	7.0	a-d

60	Iprodione Pro	5	fl oz/1000 ft ²	14 days	7.3	c-f	6.5	e-i	5.8	b-h
61	Trinity	1	fl oz/1000 ft ²	14 days	5.8	ij	6.8	d-h	5.5	c-h
62	Insignia	0.7	oz/1000 ft ²	14 days	7.0	d-g	5.8	h-k	5.8	b-h
62	Trinity	1	fl oz/1000 ft ²	14 days						
63	Honor	1.1	oz/1000 ft ²	14 days	7.0	d-g	7.3	b-f	5.8	b-h
65	Concert	4.5	fl oz/1000 ft ²	14 days	7.0	d-g	6.3	f-j	6.3	a-g
66	Concert	5.4	fl oz/1000 ft ²	14 days	6.3	g-j	5.5	ijk	6.0	b-h
67	Untreated Control				5.8	ij	5.3	jk	4.3	h

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD)

^c Treatments applied on a 7 day alternating schedule with part A applied on 6/16 and 7/14, and part B on 7/1, 7/29, and 8/12.

^d Treatments applied on a 14 day alternating schedule with part A applied on 6/16, 7/14, and 8/12, and part B on 7/1 and 7/29.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Foliar Anthracnose Fairway Study, 2009

A preventative foliar anthracnose study was set up on an annual bluegrass fairway at the Hancock Turfgrass Research Center, East Lansing, MI. The study was set up in a randomized complete block design with 4 replicates of each treatment. Plots measured 3' x 6'. Treatments were applied using a CO₂ backpack sprayer at 40 PSI and 96 GPA using a double nozzle boom with 8002E Tee Jet flat fan nozzles. Granular treatments were pre-weighed and applied by hand. The annual bluegrass study area was inoculated with *Colletotrichum cereale* grown on sand/cornmeal using a drop spreader on 6/1, 6/25, and 7/9/09. Plots were fertilized at a rate of 0.4 lb N/1000 ft²/month using Country Club fertilizer (18-4-12). The entire study area was treated with Emerald (0.13 oz /1000 sq ft) for dollar spot control on 6/25/09. Treatments were applied beginning on 6/18/09, or as noted in Tables 5-6. Subsequent applications of the 14-day treatments were made on 7/3, 7/16, 7/29, and 8/13, or as shown in Tables 5-6. For treatments that were applied on an alternating schedule, application dates are provided in Tables 5-6. Plots were rated by visual estimation of percent area infected with anthracnose (Table 5). Quality ratings were taken using a 1-10 scale where 1 = poor, 7 = acceptable, and 10 = excellent turf quality (Table 6). Data were analyzed using ANOVA and means separated by LSD (p=0.05).

Foliar anthracnose began to develop in the study area in mid July, with the untreated control plots reaching their highest average infection ratings of 31% on 8/15/09 and 39% on 8/29/09 (Table 5). Many of the fungicides alone and in combinations provided statistically significant anthracnose control when compared to the untreated control plots, particularly when considering the 7/29, 8/11, and 8/15 rating dates. Many treatments, including Interface, Trinity (1 fl oz/1000 ft²/14 days), Eagle, Instrata, Disarm C, and Signature/Triton Flo in combination, in addition to some other combinations and alternations as shown in Table 5, provided good foliar anthracnose control. Turfgrass quality varied in the study, and many treatments listed in Table 6 provided acceptable quality, but Interface provided superior turfgrass quality for both ratings.

Table 5. Foliar anthracnose study, 2009.**Location:** Hancock Turfgrass Research Center, East Lansing, MI.**Rating Type:** Percent plot area infected with anthracnose.

Trt	Treatment		Rate	Application	7/29/09		8/11/09		8/15/09		8/29/09	
No.	Name	Rate	Unit	Interval	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
30	Interface	5	fl oz/1000 ft ²	21 days	0.9	cd	0.5	c	2.8	f	4.8	d
26	Triton Flo	0.5	fl oz/1000 ft ²	21days	0.1	d	1.0	c	4.4	ef	4.5	d
26	Chipco Signature	4	oz/1000 ft ²	21days								
17	A17601 A	0.81	fl oz/1000 ft ²	21days	3.9	bcd	3.5	c	5.3	ef	12.5	bcd
24	Trinity	1	fl oz/1000 ft ²	21days	3.3	bcd	5.3	c	5.5	ef	6.3	cd
16	A17595 A	1.7	fl oz/1000 ft ²	21days	2.3	cd	2.5	c	5.8	ef	3.3	d
19	A13703 G	0.32	fl oz/1000 ft ²	21days	1.0	cd	1.0	c	6.3	ef	3.8	d
41	Eagle 20EW	1.2	fl oz/1000 ft ²	14 days	4.1	bcd	4.0	c	6.3	ef	4.8	d
34	Instrata	4	fl oz/1000 ft ²	14 days	3.8	bcd	2.8	c	7.5	def	4.0	d
37	Disarm C	4.4	fl oz/1000 ft ²	14 days	2.3	cd	2.0	c	7.5	def	6.0	cd
39	Disarm M	1	fl oz/1000 ft ²	14 days	4.0	bcd	6.8	c	7.5	def	5.6	cd
29	Banner Maxx	2	fl oz/1000 ft ²	21 days	2.0	cd	3.8	c	7.6	def	5.5	cd
38	Disarm M	0.5	fl oz/1000 ft ²	14 days	1.6	cd	3.0	c	8.3	c-f	11.3	bcd
23	A14212 C	1.5	fl oz/1000 ft ²	21days	6.5	bcd	5.3	c	8.8	c-f	6.8	cd
44	Concert	5.4	fl oz/1000 ft ²	14 days	4.8	bcd	3.3	c	10.0	c-f	5.3	cd
18	A17601 A	1.61	fl oz/1000 ft ²	21days	2.9	bcd	4.3	c	10.5	c-f	13.8	a-d
22	A8122 B	0.314	fl oz/1000 ft ²	21days	4.5	bcd	7.5	c	10.8	c-f	12.8	a-d
35	Heritage G	4	lb/1000 ft ²	14 days	5.0	bcd	7.3	c	10.8	c-f	13.3	a-d
28	Reserve	3.6	fl oz/1000 ft ²	21 days	2.5	cd	2.0	c	12.0	b-f	8.3	cd
14	A16841 A	0.247	fl oz/1000 ft ²	21days	5.8	bcd	3.5	c	12.3	b-f	11.3	bcd
20	A13703 G	0.5	fl oz/1000 ft ²	21days	2.6	cd	1.8	c	12.3	b-f	2.5	d
36	Concert	4.5	fl oz/1000 ft ²	14 days	10.6	a-d	10.0	c	12.6	b-f	8.3	cd
15	A16841 A	0.494	fl oz/1000 ft ²	21days	2.8	cd	5.0	c	12.8	b-f	15.3	a-d
32	Insignia	0.7	oz/1000 ft ²	14 days	3.3	bcd	7.8	c	13.3	b-f	21.3	a-d
32	Trinity	1	fl oz/1000 ft ²	14 days								
46	Banner Maxx	2	fl oz/1000 ft ²	14 days	10.3	a-d	11.5	c	14.0	b-f	14.3	a-d
27	Triton Flo	0.75	fl oz/1000 ft ²	21 days	2.8	cd	4.3	c	15.3	b-f	12.5	bcd

43	Disarm 480SC	0.36	fl oz/1000 ft ²	14 days	8.3	a-d	12.0	bc	17.0	b-f	22.0	a-d
31	Trinity	1	fl oz/1000 ft ²	14 days	9.8	a-d	15.0	bc	17.5	b-f	16.3	a-d
40	Veranda 11.25%	0.9	oz/1000 ft ²	14 days	7.0	bcd	15.8	bc	18.3	a-f	20.1	a-d
1	Tourney	0.28	oz/1000 ft ²	14 days	5.5	bcd	12.5	bc	20.0	a-f	20.0	a-d
25	Astron	1.5	fl oz/1000 ft ²	14 days	7.5	a-d	16.8	bc	21.3	a-f	26.3	a-d
25	Echo Ultimate	2	oz/1000 ft ²	14 days								
25	Knife Plus	1	fl oz/1000 ft ²	14 days								
25	PK Fight	2	fl oz/1000 ft ²	14 days								
25	Power 6-12-3	5	fl oz/1000 ft ²	14 days								
25	Power C3 23-0-0	4.5	fl oz/1000 ft ²	14 days								
25A	Protesyn	3	fl oz/1000 ft ²	14 days ALT ^c								
25B	Floradox Pro	3	fl oz/1000 ft ²	14 days ALT								
21	A8122 B	0.157	fl oz/1000 ft ²	21days	10.8	a-d	21.3	abc	22.0	a-f	22.5	a-d
12	A6780 L	1	fl oz/1000 ft ²	21days	10.8	a-d	13.8	bc	22.5	a-f	22.3	a-d
13	A6780 L	1.5	fl oz/1000 ft ²	21days	8.0	a-d	13.0	bc	22.5	a-f	15.8	a-d
33	Honor	1.1	oz/1000 ft ²	14 days	8.0	a-d	16.8	bc	23.8	a-f	36.3	ab
42	Daconil Ultrex	6	lb ai/a	14 days	8.3	a-d	16.3	bc	23.8	a-f	21.8	a-d
2	Tourney	0.37	oz/1000 ft ²	14 days	9.5	a-d	17.5	bc	25.0	a-f	16.3	a-d
45	Untreated Control				15.5	a-d	22.5	abc	31.3	a-e	38.8	a

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c Treatments applied on a 14 day alternating schedule with part A applied on 6/18, 7/16, and 8/13, and part B on 7/3 and 7/29.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 6. Foliar anthracnose, 2009**Location:** Hancock Turfgrass Research Center, East Lansing, MI.**Rating Type:** Turfgrass quality.**Rating Scale:** 1 – 10, where 1=poor, 7=acceptable, and 10=excellent.

Trt No.	Treatment Name	Rate	Unit	Application Interval	8/6/09		8/12/09	
					Mean	LSD	Mean	LSD
1	Tourney	0.28	oz/1000 ft ²	14 days	5.5	b-e	6.0	a-e
2	Tourney	0.37	oz/1000 ft ²	14 days	5.5	b-e	5.5	b-e
12	A6780 L	1	fl oz/1000 ft ²	21 days	5.5	b-e	5.8	a-e
13	A6780 L	1.5	fl oz/1000 ft ²	21 days	5.5	b-e	5.5	b-e
14	A16841 A	0.247	fl oz/1000 ft ²	21 days	6.0	a-e	6.5	a-d
15	A16841 A	0.494	fl oz/1000 ft ²	21 days	6.3	a-e	6.5	a-d
16	A17595 A	1.7	fl oz/1000 ft ²	21 days	6.3	a-e	6.8	a-d
17	A17601 A	0.81	fl oz/1000 ft ²	21 days	6.0	a-e	6.5	a-d
18	A17601 A	1.61	fl oz/1000 ft ²	21 days	6.3	a-e	6.3	a-d
19	A13703 G	0.32	fl oz/1000 ft ²	21 days	7.0	a-d	7.0	abc
20	A13703 G	0.5	fl oz/1000 ft ²	21 days	6.8	a-e	6.8	a-d
21	A8122 B	0.157	fl oz/1000 ft ²	21 days	5.5	b-e	5.8	a-e
22	A8122 B	0.314	fl oz/1000 ft ²	21 days	5.8	a-e	6.3	a-d
23	A14212 C	1.5	fl oz/1000 ft ²	21 days	6.0	a-e	6.5	a-d
24	Trinity	1	fl oz/1000 ft ²	21 days	6.3	a-e	6.3	a-d
25	Astron	1.5	fl oz/1000 ft ²	14 days	6.0	a-e	5.0	cde
25	Echo Ultimate	2	oz/1000 ft ²	14 days				
25	Knife Plus	1	fl oz/1000 ft ²	14 days				
25	PK Fight	2	fl oz/1000 ft ²	14 days				
25	Power 6-12-3	5	fl oz/1000 ft ²	14 days				
25	Power C3 23-0-0	4.5	fl oz/1000 ft ²	14 days				
25A	Protesyn	3	fl oz/1000 ft ²	14 days ALT ^c				
25B	Floradox Pro	3	fl oz/1000 ft ²	14 days ALT				
26	Triton Flo	0.5	fl oz/1000 ft ²	21 days	7.8	ab	6.8	a-d
26	Chipco Signature	4	oz/1000 ft ²	21 days				
27	Triton Flo	0.75	fl oz/1000 ft ²	21 days	5.8	a-e	6.5	a-d

28	Reserve	3.6	fl oz/1000 ft ²	21 days	6.8	a-e	6.8	a-d
29	Banner Maxx	2	fl oz/1000 ft ²	21 days	6.8	a-e	7.3	ab
30	Interface	5	fl oz/1000 ft ²	21 days	8.0	a	7.8	a
31	Trinity	1	fl oz/1000 ft ²	14 days	5.3	cde	5.5	b-e
32	Insignia	0.7	oz/1000 ft ²	14 days	6.5	a-e	5.8	a-e
32	Trinity	1	fl oz/1000 ft ²	14 days				
33	Honor	1.1	oz/1000 ft ²	14 days	5.8	a-e	6.0	a-e
34	Instrata	4	fl oz/1000 ft ²	14 days	6.5	a-e	6.8	a-d
35	Heritage G	4	lb/1000 ft ²	14 days	6.0	a-e	6.3	a-d
36	Concert	4.5	fl oz/1000 ft ²	14 days	5.8	a-e	6.5	a-d
37	Disarm C	4.4	fl oz/1000 ft ²	14 days	6.8	a-e	6.8	a-d
38	Disarm M	0.5	fl oz/1000 ft ²	14 days	6.5	a-e	6.8	a-d
39	Disarm M	1	fl oz/1000 ft ²	14 days	6.3	a-e	7.0	abc
40	Veranda 11.25%	0.9	oz/1000 ft ²	14 days	5.0	de	5.8	a-e
41	Eagle 20EW	1.2	fl oz/1000 ft ²	14 days	6.0	a-e	6.3	a-d
42	Daconil Ultrex	6	lb ai/a	14 days	5.3	cde	5.3	b-e
43	Disarm 480SC	0.36	fl oz/1000 ft ²	14 days	6.0	a-e	6.3	a-d
44	Concert	5.4	fl oz/1000 ft ²	14 days	6.5	a-e	6.5	a-d
45	Untreated Control				4.8	de	5.0	cde
46	Banner Maxx	2	fl oz/1000 ft ²	14 days	6.3	a-e	6.5	a-d

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c Treatments applied on a 14 day alternating schedule with part A applied on 6/18, 7/16, and 8/13, and part B on 7/3 and 7/29.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

**2008 – 2009 Fungicide Report [Summer Patch]
Department of Plant Pathology
Michigan State University**

Dr. J. M. Vargas, Jr., Nancy Dykema, Ron Detweiler, Kevin Bishop, Eric Largent, Michael Wandersee, Kyle Fischer, Kristen Dykema, Paul Giordano, and Liewei Yan

Summer Patch (*Magnaporthe poae*), 2009

This study was established on an irrigated annual bluegrass fairway at the Dearborn Country Club in Dearborn, MI. The study consisted of 4 replicate 6'x 9' plots in a random block design. Treatments were applied using a CO₂ backpack sprayer at 40 PSI and 96 GPA, and they were lightly watered in after application. Treatments were initially applied when the soil temperature at 2" soil depth was 75° on June 4, 2009. Subsequent reapplications were made at intervals listed in Tables 7 and 8. An average of 0.3 lb nitrogen/1000 sq ft/month using Country Club (18-4-12) was applied to the study in ¼ lb nitrogen applications on the following dates: 6/4, 6/24, and 8/6. The entire study area was background sprayed with Subdue (1 fl oz/1000 sq ft) and Chipco 26GT (2 fl oz/1000 sq ft) to control dollar spot, brown patch, and Pythium blight on 7/13/09 and 7/27/09. Data represent percent plot area diseased (Table 7). Quality ratings are provided in Table 8. They were taken using a 1-10 scale where 1 = poor, 7 = acceptable, and 10 = excellent turf quality. Data were analyzed using ANOVA and means separated by LSD (p=0.05).

Due to the cool, moist weather experienced this summer, summer patch pressure was mild this season with the untreated control plot averaging a maximum of 23% disease by mid August (Table 7.) Under these mild conditions, most of the products tested gave acceptable control of the summer patch on all rating dates. Exceptions were Rubigan AS, Insignia, and Disarm 480SC which were unreliable in the mid to late-season ratings. Due to the low disease pressure, turfgrass quality was generally acceptable throughout the season, with the DMI fungicides and combinations in particular, displaying good turf quality (Table 8.) No phytotoxicity was observed in the study this year except in the Rubigan and Rubigan/GWN 9812 treatments where the plant growth regulator effect caused the perennial ryegrass clumps within the plot to become more obvious.

Table 7. Summer Patch, 2009**Location:** Dearborn Country Club, Dearborn, MI**Rating Type:** Percent plot area infected with summer patch.

Trt	Treatment		Rate	Application	8/6/09		8/17/09		9/1/09	
No.	Name	Rate	Unit	Interval	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
14	Triton Flo	1	fl oz/1000 ft ²	75+30+30 ^c	1.3	a	0.8	c	0.0	e
15	Banner Maxx	2	fl oz/1000 ft ²	75+30+30 ^c	1.8	a	0.0	c	0.0	e
13	Triton Flo	0.75	fl oz/1000 ft ²	75+30+30 ^c	2.5	a	0.0	c	0.0	e
23	Trinity	2	fl oz/1000 ft ²	75+30+30 ^c	3.0	a	0.3	c	0.0	e
26	Headway	3	fl oz/1000 ft ²	75+30+30 ^c	6.3	a	0.3	c	0.0	e
25	Banner Maxx	4	fl oz/1000 ft ²	75+30+30 ^c	9.0	a	0.0	c	0.0	e
22	Insignia	0.7	oz/1000 ft ²	75+30+30 ^c	3.0	a	1.0	c	0.3	e
22	Trinity	1.5	fl oz/1000 ft ²	75+30+30 ^c						
10	Legacy F	1.01	fl oz/1000 ft ²	75+30+30 ^c	1.3	a	0.0	c	0.5	de
19	Reserve	4.5	fl oz/1000 ft ²	75+30+30+30 ^d	3.8	a	1.8	c	0.5	de
1	Rubigan AS	2	fl oz/1000 ft ²	75+30+30 ^c	20.0	a	5.3	bc	0.5	de
17	Reserve	3.2	fl oz/1000 ft ²	75+30+30+30 ^d	0.1	a	1.3	c	0.8	de
8	Legacy F	0.503	fl oz/1000 ft ²	75+30+30+30 ^d	2.0	a	3.3	c	0.8	de
3	Banner Maxx	2	fl oz/1000 ft ²	75+30+30 ^c	4.5	a	0.0	c	0.8	de
18	Reserve	3.6	fl oz/1000 ft ²	75+30+30+30 ^d	7.5	a	0.0	c	0.8	de
20	Concert	5	fl oz/1000 ft ²	75+30+30+30 ^d	8.8	a	0.0	c	0.8	de
11	Banner Maxx	3.24	fl oz/1000 ft ²	75+30+30 ^c	3.5	a	0.0	c	1.3	de
9	Legacy F	0.754	fl oz/1000 ft ²	75+30+30+30	7.5	a	1.3	c	1.3	de
2	Rubigan AS	2	fl oz/1000 ft ²	75+30+30 ^c	10.0	a	2.5	c	1.3	de
2	GWN-9812	0.74	fl oz/1000 ft ²	75+30+30 ^c						
7	Disarm M	1	fl oz/1000 ft ²	75 + 28 ^e	3.5	a	0.8	c	1.5	de
16	Reserve	2.8	fl oz/1000 ft ²	75+30+30+30 ^d	7.5	a	2.5	c	1.8	de
12	Triton Flo	0.5	fl oz/1000 ft ²	75+30+30 ^c	12.5	a	6.8	bc	4.3	cde
24	Heritage G	4	lb/1000 ft ²	75+21+21 ^f	8.8	a	12.5	b	6.3	b-e
6	Disarm M	0.5	fl oz/1000 ft ²	75 + 28 ^e	12.5	a	3.0	c	6.5	b-e
4	Rubigan AS	4	fl oz/1000 ft ²	75+30+30 ^c	20.5	a	20.5	a	11.8	bc

5	Disarm 480SC	0.36	fl oz/1000 ft ²	75 + 28 ^e	13.8	a	3.8	c	12.0	bc
21	Insignia	0.9	oz/1000 ft ²	75+30+30 ^c	11.3	a	7.3	bc	13.5	ab

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Treatment applications made on the following dates as indicated in table above:

^c 75° + 30 + 30 day – 6/4, 7/2, 7/27

^d 75° + 30 + 30 + 30 day – 6/4, 7/2, 7/27

^e 75° + 28 day – 6/4, 7/2

^f 75° + 21 + 21 day – 6/4, 6/24, 7/13

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 8. Summer Patch, 2009

Location: Dearborn Country Club, Dearborn, MI

Rating Type: Turfgrass quality.

Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Rating Date					8/17/09		9/1/09		9/18/09	
Trt	Treatment	Rate	Unit	Application	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
1	Rubigan AS	2	fl oz/1000 ft ²	75+30+30 ^c	7.3	bcd	7.0	bcd	7.3	abc
2	Rubigan AS	2	fl oz/1000 ft ²	75+30+30	7.5	abc	7.0	bcd	7.0	bcd
2	GWN-9812	0.74	fl oz/1000 ft ²	75+30+30						
3	Banner Maxx	2	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	7.5	ab	7.0	bcd
4	Rubigan AS	4	fl oz/1000 ft ²	75+30+30 ^c	6.5	ef	6.3	ef	7.0	bcd
5	Disarm 480SC	0.36	fl oz/1000 ft ²	75 + 28 ^e	7.0	cde	6.5	de	6.3	ef
6	Disarm M	0.5	fl oz/1000 ft ²	75 + 28 ^e	6.8	de	6.8	cde	6.8	cde
7	Disarm M	1	fl oz/1000 ft ²	75 + 28 ^e	7.0	cde	7.3	bc	7.3	abc
8	Legacy F	0.503	fl oz/1000 ft ²	75+30+30+30 ^d	7.3	bcd	7.0	bcd	7.3	abc
9	Legacy F	0.754	fl oz/1000 ft ²	75+30+30+30 ^d	7.0	cde	7.0	bcd	7.5	ab
10	Legacy F	1.01	fl oz/1000 ft ²	75+30+30 ^c	7.8	ab	7.0	bcd	7.3	abc
11	Banner Maxx	3.24	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	7.3	bc	7.3	abc
12	Triton Flo	0.5	fl oz/1000 ft ²	75+30+30 ^c	7.0	cde	6.8	cde	6.8	cde
13	Triton Flo	0.75	fl oz/1000 ft ²	75+30+30 ^c	7.5	abc	7.0	bcd	7.0	bcd
14	Triton Flo	1	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	7.5	ab	7.3	abc
15	Banner Maxx	2	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	7.0	bcd	7.8	a
16	Reserve	2.8	fl oz/1000 ft ²	75+30+30+30 ^d	7.5	abc	7.0	bcd	7.3	abc

17	Reserve	3.2	fl oz/1000 ft ²	75+30+30+30 ^d	7.3	bcd	7.0	bcd	7.5	ab
18	Reserve	3.6	fl oz/1000 ft ²	75+30+30+30 ^d	7.5	abc	7.0	bcd	7.3	abc
19	Reserve	4.5	fl oz/1000 ft ²	75+30+30+30 ^d	7.3	bcd	7.0	bcd	7.5	ab
20	Concert	5	fl oz/1000 ft ²	75+30+30+30 ^d	7.5	abc	7.0	bcd	7.5	ab
21	Insignia	0.9	oz/1000 ft ²	75+30+30 ^c	7.0	cde	6.3	ef	6.5	def
22	Insignia	0.7	oz/1000 ft ²	75+30+30 ^c	7.8	ab	7.5	ab	7.5	ab
22	Trinity	1.5	fl oz/1000 ft ²	75+30+30 ^c						
23	Trinity	2	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	7.5	ab	7.5	ab
24	Heritage G	4	lb/1000 ft ²	75+21+21 ^f	6.8	de	6.3	ef	6.5	def
25	Banner Maxx	4	fl oz/1000 ft ²	75+30+30 ^c	7.8	ab	7.3	bc	7.8	a
26	Headway	3	fl oz/1000 ft ²	75+30+30 ^c	8.0	a	8.0	a	7.3	abc
29	Untreated Control			---	7.0	cde	7.0	bcd	6.8	cde

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Treatment applications made on the following dates as indicated in table above:

^c 75° + 30 + 30 day – 6/4, 7/2, 7/27

^d 75° + 30 + 30 + 30 day – 6/4, 7/2, 7/27

^e 75° + 28 day – 6/4, 7/2

^f 75° + 21 + 21 day – 6/4, 6/24, 7/13

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

**2008 – 2009 Fungicide Report [Summer Stress]
Department of Plant Pathology
Michigan State University**

Dr. J. M. Vargas, Jr., Nancy Dykema, Ron Detweiler, Kevin Bishop, Eric Largent, Michael Wandersee, Kyle Fischer, Kristen Dykema, Paul Giordano, and Liewei Yan

Summer Stress in Creeping Bentgrass, 2009

This trial was conducted on an A4 creeping bentgrass green at the Hancock Turfgrass Research Center, E. Lansing, MI. The plot area was initially mowed at 0.156" using a triplex mower and gradually reduced to 0.125" using a walk-behind mower. Fertility was maintained at approximately 0.25 lb. N/1000 ft²/ month with Country Club 18-4-12 fertilizer over the entire study. Cascade was applied at a rate of 7 lb/1000 ft² on 7/14 and 8/7. The study was set up in a randomized complete block design with four replications of each treatment. Plots measured 2' x 6' with 1' alleys. Treatments were applied at 42 PSI in a 48 GPA spray volume using a CO₂ backpack sprayer and a single 8002E Tee-Jet flat fan nozzle. Initial treatment applications were made on June 10, unless specified otherwise in Tables 8 and 9. All treatments were reapplied on 6/23, 7/8, 7/20, 8/4, and 8/14 unless indicated otherwise in Tables 9 and 10. Quality ratings, which were a combination of turfgrass color and density, were visually estimated using a 1 to 10 scale, where 1 = poor, 7 = acceptable, and 10 = excellent. All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Stressful conditions on this creeping bentgrass research putting green were achieved due to a combination of the low mowing height, moderate drought, and summer heat. Turfgrass quality in the untreated control plots declined as the study progressed with the lowest average quality ratings occurring in mid-August (Table 9.) There were predominately tank-mixed combinations and some stand alone products tested in this study this year that provided superior turfgrass quality throughout the study period compared to the untreated controls. In addition, this year two Turf Labs and one Floratine Products program treatments were tested where combinations of several products were applied in a program approach for the duration of the study. Other combinations tested were comprised of only two products. The Daconil Ultrex + Signature treatment continued to provide excellent turfgrass quality through the course of this trial and has continued to be the standard to which other products are compared. This year, the program treatments from Turf Labs and Floratine, Legacy F/Chipco Signature, Reserve, Interface, QP Fosetyl-Al/Green Lawnger, QP Fosetyl-Al/Fore, and Triton Flo/Signature have provided significantly better turfgrass quality than the untreated control and have maintained the level of quality achieved with the Signature/Daconil Ultrex combination on most of the rating dates (see Table 9.) Several other products/product combinations tested exhibited turfgrass quality that was superior to the untreated control, but sometimes this level of quality would not be considered acceptable by golf industry standards. No phytotoxicity was observed in the study.

Table 9. 2009 Summer Stress in Creeping Bentgrass
Location: Hancock Turfgrass Research Center, East Lansing, MI
Rating Type: Turfgrass quality
Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Trt No	Treatment Name	Rate	Unit	Application Interval	6/22/2009		7/6/2009		7/14/2009		8/4/2009		8/19/2009	
					Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
28	12-2-12-0.5 Fe	18	fl oz/1000 ft ²	14 days	7.3	bcd	7.8	ab	8.0	a	8.0	abc	8.3	a
28	Phos-Shield 0-30-30	3	fl oz/1000 ft ²	14 days										
28	"Soil Site" Calcium 1-0-0-8 Ca	3	fl oz/1000 ft ²	14 days										
28	Minors Mix 5-0-1	6	fl oz/1000 ft ²	14 days										
28	Cyto-Kelp 0-0-2	6	fl oz/1000 ft ²	14 days										
28	Daconil Ultrex	3.2	oz/1000 ft ²	14 days										
29	12-2-12-0.5 Fe	18	fl oz/1000 ft ²	14 days	7.8	abc	8.0	a	7.5	abc	8.0	abc	8.3	a
29	"Soil Site" Calcium 1-0-0-8 Ca	3	fl oz/1000 ft ²	14 days										
29	Minors Mix 5-0-1	6	fl oz/1000 ft ²	14 days										
29	Cyto-Kelp 0-0-2	6	fl oz/1000 ft ²	14 days										
29	Daconil Ultrex	3.2	oz/1000 ft ²	14 days										
20	Signature	4	oz/1000 ft ²	14 days	8.0	ab	8.0	a	7.8	ab	8.5	a	8.0	ab
20	Daconil Ultrex	3.2	oz/1000 ft ²	14 days										
8	Astron	2	fl oz/1000 ft ²	14 days	7.3	bcd	7.3	a-d	7.8	ab	7.5	b-e	8.0	ab
8	Echo Ultimate	3.25	oz/1000 ft ²	14 days										
8	Knife Plus	2	fl oz/1000 ft ²	14 days										
8	PK Fight	3	fl oz/1000 ft ²	14 days										
8	Power 6-12-3	5	fl oz/1000 ft ²	14 days										
8	Power C3 23-0-0	4	fl oz/1000 ft ²	14 days										
8	Protesyn	3	fl oz/1000 ft ²	14 days										
9	Legacy F	1.01	fl oz/1000 ft ²	14 days	7.5	a-d	7.3	a-d	7.3	a-d	7.3	c-f	7.8	abc
9	Chipco Signature	3.93	oz/1000 ft ²	14 days										
16	Reserve	3.6	fl oz/1000 ft ²	14 days	8.3	a	7.3	a-d	8.0	a	7.8	a-d	7.8	abc
18	Interface	5	fl oz/1000 ft ²	14 days	7.0	cde	7.0	b-e	7.5	abc	7.5	b-e	7.8	abc
30	QP Fosetyl-Al	4	oz/1000 ft ²	14 days	7.8	abc	7.8	ab	8.0	a	7.5	b-e	7.5	a-d

30	Green Lawnger	15	fl oz/1000 ft ²	14 days										
3	QP Fosetyl-AI	4	oz/1000 ft ²	14 days	7.5	a-d	7.8	ab	7.5	abc	8.0	abc	7.3	b-e
3	Fore	4	oz/1000 ft ²	14 days										
14	Triton Flo	0.5	fl oz/1000 ft ²	14 days	8.3	a	7.5	abc	8.0	a	7.0	d-g	7.3	b-e
14	Chipco Signature	4	oz/1000 ft ²	14 days										
19	Signature	4	oz/1000 ft ²	14 days	7.5	a-d	7.3	a-d	7.3	a-d	7.0	d-g	7.0	cde
19	Chipco 26GT	4	fl oz/1000 ft ²	14 days										
4	QP Fosetyl-AI	4	oz/1000 ft ²	14 days	7.0	cde	6.8	c-f	7.0	b-e	6.3	ghi	6.5	efg
4	Match Play turf colorant	850	oz/100 gal	14 days										
6	Chipco Signature	4	oz/1000 ft ²	14 days	7.0	cde	7.0	b-e	7.0	b-e	6.5	fgh	6.5	efg
11	Legacy F	1.01	fl oz/1000 ft ²	14 days	7.3	bcd	6.5	d-g	6.8	cde	7.0	d-g	6.5	efg
15	Triton Flo	0.75	fl oz/1000 ft ²	14 days	7.0	cde	6.5	d-g	7.0	b-e	6.3	ghi	6.5	efg
1	QP Fosetyl-AI	4	oz/1000 ft ²	14 days	7.0	cde	6.8	c-f	6.3	efg	6.0	hij	5.8	gh
2	QP Fosetyl-AI	4	oz/1000 ft ²	14 days	7.0	cde	6.5	d-g	5.8	fg	6.3	ghi	5.5	h
2	Quali-Gard	0.36	oz/1000 ft ²	14 days										
5	QP Fosetyl-AI	4	oz/1000 ft ²	14 days	7.0	cde	6.0	fg	6.5	def	6.3	ghi	5.5	h
5	Turf Mark Green Spray Indicator	10	oz/100 gal	14 days										
17	Banner Maxx	2	fl oz/1000 ft ²	14 days	6.8	de	6.5	d-g	6.5	def	5.3	j	4.5	ij
27	Untreated Control				6.8	de	6.0	fg	5.5	g	5.3	j	4.3	j

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Summer Stress in Annual Bluegrass, 2009

This trial was conducted on an annual bluegrass green at the Hancock Turfgrass Research Center, East Lansing, MI. The plot area was initially mowed at 0.156" using a triplex mower and gradually reduced to 0.125" using a walk-behind mower. Fertility was maintained at approximately 0.4 lb. N/1000 ft²/ month with Country Club 18-4-12 fertilizer, except for treatment 8 which was a program treatment that included fertilizer. The study was set up in a randomized complete block design with four replications of each treatment. Plots measured 2' x 6' with 1' alleys. Treatments were applied at 42 PSI in a 48 GPA spray volume using a CO₂ backpack sprayer and a single 8002E Tee-Jet flat fan nozzle. Initial treatment applications were made on June 10, unless specified otherwise in Tables 10. The 7-day treatment was reapplied on 6/10, 6/16, 6/23, 6/30, 7/7, 7/20, 7/28, 8/5, and 8/11. All 14 day interval treatments were reapplied on 6/23, 7/8, 7/20, 8/5, and 8/14, or as listed in Table 10. Quality ratings, which were a combination of turfgrass color and density, were visually estimated using a 1 to 10 scale, where 1 = poor, 7 = acceptable, and 10 = excellent. All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Once again, the annual bluegrass stress study endured tremendous stress this season. The untreated control plots were very thin, off-color, and exhibited poor overall turfgrass quality earning a quality rating of only 4 at its best, and reaching a low average of 3 by mid-August. However, even under such stressful conditions, several treatments provided excellent turfgrass quality. Based on the performance of the untreated controls, treatments achieving a rating of 6 or higher would be considered excellent performers even though the quality may not meet industry standards for excellence. Most of the treatments tested, therefore, exhibited significantly better turfgrass quality than the untreated controls. Some of the treatments with the best average turfgrass quality ratings were Triton Flo alone, Triton Flo/Signature tank-mixed, Reserve, Legacy F/Signature, Floratine program treatment, Interface, Turf Labs program treatment, QP Fosetyl-Al/Fore, Signature/Daconil Ultrex, and Signature/26GT (Table 10). No phytotoxicity was observed in the study.

Table 10. 2009 Summer Stress in Annual Bluegrass
Location: Hancock Turfgrass Research Center, East Lansing, MI
Rating Type: Turfgrass quality
Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Trt	Treatment		Rate	Appl	6/22/2009		7/2/2009		7/14/2009		8/3/2009		8/14/2009		8/25/2009	
No	Name	Rate	Unit	Code	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
15	Triton Flo	1	fl oz/1000 ft2	14 days	5.8	b-e	6.0	b-e	7.3	abc	6.3	bcd	7.5	ab	7.0	bc
14	Triton Flo	0.5	fl oz/1000 ft2	14 days	6.3	a-d	6.3	bcd	7.3	abc	6.5	bc	7.3	bc	7.3	ab
14	Chipco Signature	4	oz/1000 ft2	14 days												
16	Reserve	3.6	fl oz/1000 ft2	14 days	6.5	abc	6.3	bcd	7.5	ab	6.0	b-e	7.3	bc	6.8	bcd
9	Legacy F	1.01	fl oz/1000 ft2	14 days	6.0	a-e	6.3	bcd	7.3	abc	6.3	bcd	7.0	bcd	6.8	bcd
9	Chipco Signature	3.93	oz/1000 ft2	14 days												
11	Legacy F	1.01	fl oz/1000 ft2	14 days	6.3	a-d	7.0	ab	6.3	def	6.5	bc	7.0	bcd	7.0	bc
8	Astron ^c	1.5	fl oz/1000 ft2	7 days	7.0	a	6.5	abc	5.8	e-h	6.5	bc	7.0	bcd	6.3	c-f
8	Echo Ultimate ^c	1.5	oz/1000 ft2	7 days												
8	Knife Plus ^c	1	fl oz/1000 ft2	7 days												
8	PK Fight ^c	2	fl oz/1000 ft2	7 days												
8	Power 6-12-3 ^c	5	fl oz/1000 ft2	7 days												
8	Power C3 23-0-0 ^c	4	fl oz/1000 ft2	7 days												
8	Protesyn ^c	2.5	fl oz/1000 ft2	7 days												
28	12-2-12-0.5 Fe			14 days	5.3	def	5.0	e-h	5.0	hij	5.3	efg	6.5	cde	6.3	c-f
28	Phos-Shield 0-30-30			14 days												
28	"Soil Site" Calcium 1-0-0-8 Ca			14 days												
28	Minors Mix 5-0-1			14 days												
28	Cyto-Kelp 0-0-2			14 days												
28	Daconil Ultrex	3.2	oz/1000 ft2	14 days												
18	Interface	5	fl oz/1000 ft2	14 days	6.3	a-d	6.5	abc	6.8	bcd	6.3	bcd	6.3	def	5.8	e-h
29	12-2-12-0.5 Fe			14 days	6.0	a-e	5.3	d-g	5.8	e-h	5.8	c-f	6.3	def	5.8	e-h
29	"Soil Site" Calcium 1-0-0-8 Ca			14 days												
29	Minors Mix 5-0-1			14 days												
29	Cyto-Kelp 0-0-2			14 days												

29	Daconil Ultrex	3.2	oz/1000 ft2	14 days												
3	QP Fosetyl-Al	4	oz/1000 ft2	14 days	6.3	a-d	5.8	c-f	6.0	d-g	6.0	b-e	6.0	ef	6.0	d-g
3	Fore	4	oz/1000 ft2	14 days												
17	Banner Maxx	2	fl oz/1000 ft2	14 days	5.0	efg	5.0	e-h	5.8	e-h	5.5	d-g	6.0	ef	5.8	e-h
19	Signature	4	oz/1000 ft2	14 days	6.3	a-d	6.0	b-e	5.8	e-h	5.8	c-f	6.0	ef	5.8	e-h
19	Chipco 26GT	4	fl oz/1000 ft2	14 days												
20	Signature	4	oz/1000 ft2	14 days	6.3	a-d	5.8	c-f	6.5	cde	5.8	c-f	6.0	ef	6.0	d-g
20	Daconil Ultrex	3.2	oz/1000 ft2	14 days												
6	Chipco Signature	4	oz/1000 ft2	14 days	5.8	b-e	5.8	c-f	6.3	def	5.5	d-g	5.5	fg	5.3	g-j
30	QP Fosetyl-Al	4	oz/1000 ft2	14 days	6.8	ab	6.5	abc	6.0	d-g	5.8	c-f	5.0	gh	4.5	jkl
30	Green Lawnger	15	fl oz/1000 ft2	14 days												
1	QP Fosetyl-Al	4	oz/1000 ft2	14 days	4.5	fg	4.5	gh	4.5	jk	5.0	fg	4.5	hi	4.3	klm
2	QP Fosetyl-Al	4	oz/1000 ft2	14 days	5.5	c-f	5.5	c-g	5.3	g-j	5.8	c-f	4.5	hi	4.5	jkl
2	Quali-Gard	0.36	oz/1000 ft2	14 days												
4	QP Fosetyl-Al	4	oz/1000 ft2	14 days	5.5	c-f	5.3	d-g	5.3	g-j	5.3	efg	4.5	hi	4.5	jkl
4	Match Play turf colorant	850	oz/100 gal	14 days												
5	QP Fosetyl-Al	4	oz/1000 ft2	14 days	5.0	efg	4.8	fgh	5.0	hij	4.8	gh	4.3	hij	4.8	i-l
5	Turf Mark Green Spray Indicator	10	oz/100 gal	14 days												
27	Untreated Control				4.0	g	4.0	h	4.0	k	4.0	h	3.5	j	3.0	n

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c No supplemental fertilizer added.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

**2008 – 2009 Fungicide Report [Dollar Spot]
Department of Plant Pathology
Michigan State University**

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Preventive Dollar Spot (*Sclerotinia homoeocarpa/Rutstroemia floccosum*), 2009

Preventive Dollar Spot Study #1

This dollar spot study was conducted on a creeping bentgrass/annual bluegrass fairway (0.5" height of cut). The study was set up in a randomized complete block design and consisted of 4 replicate 2' x 6' plots with 1' alleys. Treatments were applied using a CO₂ backpack sprayer at 38 PSI and 48 GPA application volume using a single 8002E Tee Jet flat fan nozzle. Initial treatment applications were made on 6/18/09. Subsequent application of the 14-day interval treatments were made on 7/1, 7/16, 7/30, 8/13, 8/27, 9/10, and 9/24, and the 21-day interval treatments on 7/9, 9/30, 8/24, and 9/10. Plots were fertilized at a rate of 0.19 lbs actual nitrogen/1000 sq ft/month using Country Club (18-4-12) fertilizer. Dollar spot ratings were taken on the dates listed in Table 11. Quality ratings were taken using a 1-10 scale where 7 = acceptable turfgrass quality, and 1= poor quality (Table 12). Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Dollar spot developed steadily in this fairway study beginning in mid-July and reaching maximum pressure in early to mid-September. The untreated controls contained an average of 45% dollar spot by the September 10 rating. During the month of August, the control plots averaged 28% early with a gradual increase to 38% by August 25. At these levels of disease, most of the treatments tested in the study provided significant dollar spot control comparatively. Tourney (14 days), Concert (21 days), Banner Maxx (21 days), a Banner Maxx/Daconil Ultrex tank mix (21 days), and several experimental compounds performed very well in this fairway study preventing disease levels from reaching more than 3.5% average dollar spot infection for the entire duration of the study. The untreated control plots exhibited very poor turfgrass quality during the months of August and September, with average quality ratings ranging from 5.3 to 3.8 (Table 12.) A few of the treatments tested produced quality ratings that were 7 or higher in six out of seven rating observations. They include Concert, Tourney, Banner Maxx/Daconil Ultrex tank mixed, and several experimental compounds. All of these treatments provided significantly better turfgrass quality than the untreated controls. No phytotoxicity was observed in this study.

Table 11. Preventive dollar spot study on a creeping bentgrass/annual bluegrass fairway, 2009.

Location: Hancock Turfgrass Research Center, East Lansing, MI.

Rating: Percent plot area infected with dollar spot.

Rating Date					7/16/2009		7/28/2009		8/7/2009		8/13/2009		8/25/2009		9/10/2009		9/25/2009	
Trt	Treatment	Rate	Unit	Appl.	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
19	Tourney	0.37	oz/1000 ft2	14 days	0.0	c	0.0	b	0.0	d	0.0	e	0.0	h	0.0	i	0.0	j
18	Tourney	0.28	oz/1000 ft2	14 days	0.0	c	0.0	b	0.0	d	0.3	e	0.2	gh	0.1	i	0.3	j
11	A8122 B	0.314	fl oz/1000 ft2	21 days	0.0	c	0.0	b	0.0	d	0.0	e	0.6	fgh	0.1	i	0.1	j
22	Concert	4.5	fl oz/1000 ft2	21 days	0.0	c	0.0	b	0.0	d	0.1	e	2.5	d-h	0.9	i	1.8	g-j
9	A9898 A	0.96	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.0	e	1.1	e-h	1.0	i	0.3	j
23	Banner Maxx	1.5	fl oz/1000 ft2	21 days	0.0	c	0.0	b	0.0	d	0.1	e	2.0	d-h	1.9	ghi	0.9	ij
1	A6780 L	1	fl oz/1000 ft2	21 days	0.0	c	0.0	b	0.0	d	0.9	e	3.5	d-h	2.0	ghi	1.4	hij
10	A8122 B	0.157	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.1	d	0.2	e	3.5	d-h	3.0	f-i	5.8	f-j
17	Banner Maxx	1.01	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.1	e	3.5	d-h	3.2	f-i	0.5	ij
17	Daconil Ultrex	1.89	oz/1000 ft2	21 days														
6	A17601 A	1.61	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.3	e	2.8	d-h	4.4	e-i	4.0	g-j
8	A13703 G	0.5	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.2	e	3.3	d-h	4.5	e-i	3.5	g-j
3	A16841 A	0.494	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.3	e	3.8	d-h	5.3	e-i	4.0	g-j
13	Trinity	1	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	0.3	e	3.0	d-h	6.0	e-i	7.0	f-i
21	A12910 C	0.76	fl oz/1000 ft2	21 days	0.0	c	0.0	b	0.0	d	0.3	e	2.5	d-h	6.3	d-i	7.0	f-i
12	A14212 C	1.5	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.0	d	1.1	e	4.5	c-h	6.8	d-i	4.3	g-j
16	Legacy F	0.503	fl oz/1000 ft2	21 days	0.0	c	0.2	b	0.0	d	0.1	e	3.3	d-h	10.5	c-h	8.0	fg
16	Chipco 26GT	1.51	fl oz/1000 ft2	21 days														
24	Chipco 26GT	3	fl oz/1000 ft2	21 days	0.0	c	0.2	b	0.0	d	0.2	e	3.9	c-h	11.3	c-g	11.5	ef
2	A16841 A	0.247	fl oz/1000 ft2	21 days	0.0	c	0.1	b	0.1	d	0.4	e	7.3	c-g	11.8	c-f	7.8	fgh
20	A12910 C	0.48	fl oz/1000 ft2	21 days	0.0	c	0.2	b	0.8	d	2.8	de	5.5	c-h	13.0	cde	12.3	def
4	A17595 A	1.7	fl oz/1000 ft2	21 days	0.0	c	0.4	b	0.0	d	1.0	e	11.0	c	15.5	cd	20.5	c
7	A13703 G	0.32	fl oz/1000 ft2	21 days	0.0	c	0.4	b	0.0	d	0.9	e	8.0	cde	15.5	cd	15.0	cde
5	A17601 A	0.81	fl oz/1000 ft2	21 days	0.1	c	0.1	b	0.0	d	0.7	e	7.5	c-f	16.3	c	14.8	cde
15	Legacy F	0.314	fl oz/1000 ft2	21 days	0.0	c	0.4	b	0.3	d	1.5	e	8.5	cd	18.5	c	18.8	cd
15	Chipco 26GT	1.01	fl oz/1000 ft2	21 days														
14	Legacy F	0.126	fl oz/1000 ft2	21 days	0.2	c	1.8	b	3.3	d	8.3	d	22.5	b	42.5	a	19.3	c
14	Chipco 26GT	0.503	fl oz/1000 ft2	21 days														
25	Untreated Control				2.3	a	6.8	a	27.5	ab	28.8	b	37.5	a	45.0	a	43.8	a

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 12. Preventive fairway dollar spot study.

Location: Hancock Turfgrass Research Center, East Lansing, MI.

Rating Type: Turfgrass quality.

Rating Scale: 1 – 10, where 1=poor, 7=acceptable, and 10=excellent.

Rating Date					7/16/2009		7/28/2009		8/7/2009		8/13/2009		8/25/2009		9/10/2009		9/25/2009	
Trt	Treatment	Rate	Unit	Application	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
1	A6780 L	1	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.3	bc	6.8	abc	6.8	def	6.3	d-g	7.0	a-d
2	A16841 A	0.247	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.0	c	7.0	abc	6.5	efg	6.0	e-h	5.8	f-i
3	A16841 A	0.494	fl oz/1000 ft ²	21 days	7.5	abc	7.0	ab	7.0	c	7.0	abc	6.5	efg	6.5	c-f	6.3	d-g
4	A17595 A	1.7	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.0	c	6.3	cd	5.8	hi	5.3	h	4.8	jkl
5	A17601 A	0.81	fl oz/1000 ft ²	21 days	7.5	abc	7.0	ab	7.3	bc	6.8	abc	6.3	fgh	5.5	gh	5.8	f-i
6	A17601 A	1.61	fl oz/1000 ft ²	21 days	6.8	cde	7.3	a	7.0	c	6.8	abc	6.8	def	6.3	d-g	6.3	d-g
7	A13703 G	0.32	fl oz/1000 ft ²	21 days	7.0	cd	7.0	ab	7.3	bc	6.8	abc	6.0	gh	5.5	gh	5.5	g-j
8	A13703 G	0.5	fl oz/1000 ft ²	21 days	7.5	abc	7.5	a	7.0	c	6.5	bcd	7.0	cde	6.3	d-g	6.5	c-f
9	A9898 A	0.96	fl oz/1000 ft ²	21 days	7.0	cd	7.3	a	7.0	c	7.0	abc	7.3	bcd	7.0	a-d	7.0	a-d
10	A8122 B	0.157	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.0	c	7.0	abc	7.0	cde	6.5	c-f	6.3	d-g
11	A8122 B	0.314	fl oz/1000 ft ²	21 days	7.5	abc	7.3	a	7.3	bc	7.5	a	7.8	ab	7.3	abc	7.8	a
12	A14212 C	1.5	fl oz/1000 ft ²	21 days	7.3	bcd	7.3	a	7.3	bc	6.8	abc	6.8	def	5.8	fgh	6.5	c-f
13	Trinity	1	fl oz/1000 ft ²	21 days	6.8	cde	7.0	ab	7.0	c	6.5	bcd	7.0	cde	6.0	e-h	6.0	e-h
14	Legacy F	0.126	fl oz/1000 ft ²	21 days	7.0	cd	6.5	bc	7.3	bc	5.8	de	5.3	ij	4.0	i	5.0	ijk
14	Chipco 26GT	0.503	fl oz/1000 ft ²	21 days														
15	Legacy F	0.314	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.0	c	6.5	bcd	6.0	gh	5.5	gh	5.3	hij
15	Chipco 26GT	1.01	fl oz/1000 ft ²	21 days														
16	Legacy F	0.503	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.0	c	7.0	abc	7.3	bcd	5.8	fgh	6.0	e-h
16	Chipco 26GT	1.51	fl oz/1000 ft ²	21 days														
17	Banner Maxx	1.01	fl oz/1000 ft ²	21 days	7.3	bcd	7.0	ab	7.3	bc	7.3	ab	7.0	cde	6.5	c-f	7.0	a-d
17	Daconil Ultrex	1.89	oz/1000 ft ²	21 days														
18	Tourney	0.28	oz/1000 ft ²	14 days	7.3	bcd	7.0	ab	7.3	bc	6.5	bcd	7.8	ab	7.5	ab	7.5	ab
19	Tourney	0.37	oz/1000 ft ²	14 days	6.8	cde	6.5	bc	7.0	c	6.5	bcd	8.0	a	7.8	a	7.8	a
20	A12910 C	0.48	fl oz/1000 ft ²	21 days	7.3	bcd	7.3	a	7.0	c	6.5	bcd	6.5	efg	5.5	gh	5.3	hij
21	A12910 C	0.76	fl oz/1000 ft ²	21 days	7.0	cd	7.0	ab	7.3	bc	7.5	a	7.5	abc	6.3	d-g	6.3	d-g
22	Concert	4.5	fl oz/1000 ft ²	21 days	7.5	abc	7.3	a	7.8	ab	6.8	abc	7.3	bcd	7.3	abc	7.3	abc
23	Banner Maxx	1.5	fl oz/1000 ft ²	21 days	6.5	de	7.3	a	7.0	c	7.3	ab	7.0	cde	6.5	c-f	6.8	b-e
24	Chipco 26GT	3	fl oz/1000 ft ²	21 days	7.0	cd	7.0	ab	7.3	bc	7.0	abc	6.5	efg	5.8	fgh	5.5	g-j

25	Untreated Control				6.0	e	5.8	d	5.3	de	4.5	f	4.0	l	3.8	i	4.0	l
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^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Preventive Dollar Spot Study #2 2009

This preventive study was set up on a creeping bentgrass putting green, with 10% or less disease already present, in four replications of a randomized complete block design. The plots measured 2' x 6' with 1' alleys. Spray treatments were applied using a CO₂ backpack sprayer set at 38 psi with a single 8002E Tee Jet flat fan nozzle. Spray volume was 48 GPA unless otherwise noted in Table 11. Plots were irrigated and fertilized as needed to maintain turf quality and vigor. Fungicide treatments were applied initially on 8/6/09 and re-applied at the intervals indicated in Tables 11 and 12. The 14-day treatments were re-applied on 8/20, 9/3, and 9/17, unless otherwise indicated in Table 11. The 21-day treatments were re-applied on 8/25 and 9/17. Data represent mean percent plot area infected with dollar spot (Table 11). Quality ratings were also taken using a 1 (worst) to 10 (excellent) scale, where 7 represents acceptable turf quality based on turf density and color (Table 12.) Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Dollar spot disease pressure was low in the creeping bentgrass preventive study this year where the untreated controls averaged less than 13% disease at their maximum. Even with this low level of dollar spot, statistical differences were observed when many of the fungicide treatments were compared to the untreated control (Table 11). However, there were few statistical differences observed among fungicide treatments for a majority of the ratings. Some of the top-performing products in this study were Tartan, Tourney, Reserve, Honor, Concert, Emerald, and several experimental fungicides. Quality differences were observed in the study with most treatments providing significantly better quality than the untreated controls (Table 12.) Reserve, Tartan, Tourney, and an experimental product were among the fungicides that exhibited acceptable quality, receiving a mean rating of 7 or higher on each rating date. No phytotoxicity was observed.

Table 11. Preventive dollar spot study on a creeping bentgrass putting green, 2009.

Location: Hancock Turfgrass Research Center, East Lansing, MI

Rating Type: Percent plot area infected with dollar spot.

Trt No.	Treatment Name	Rate	Unit	Application Interval	8/24/09		9/2/09		9/10/09		9/18/09		9/30/09	
					Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
19	Tartan	2	fl oz/1000 ft ²	14 days	0.3	k	0.2	op	0.0	n	0.0	o	0.0	f
8	Tourney	0.37	oz/1000 ft ²	14 days	2.5	e-k	0.6	m-p	0.1	n	0.1	o	0.1	f
40	BAS 50017F	0.54	fl oz/1000 ft ²	14 days	5.5	b-i	3.3	g-p	0.2	n	0.0	o	0.0	f

40	BAS 59516F	1	fl oz/1000 ft2	14 days										
24	Reserve	3.6	fl oz/1000 ft2	14 days	2.0	g-k	1.3	l-p	0.3	mn	0.2	o	0.0	f
23	Reserve	3.2	fl oz/1000 ft2	14 days	1.8	h-k	1.1	m-p	0.3	mn	0.1	o	0.0	f
16	Honor	1.1	oz/1000 ft2	14 days	3.1	c-k	1.2	l-p	0.4	mn	0.1	o	0.0	f
22	Reserve	2.8	fl oz/1000 ft2	14 days	1.8	h-k	1.0	m-p	0.6	l-n	0.3	m-o	0.1	f
25	Concert	5	fl oz/1000 ft2	14 days	2.3	f-k	1.9	j-p	0.6	l-n	0.2	o	0.0	f
18	Concert	4	fl oz/1000 ft2	14 days	1.8	h-k	1.3	k-p	0.8	k-n	0.3	no	0.0	f
14	Emerald	0.18	oz/1000 ft2	14 days	4.0	c-k	1.8	j-p	0.8	k-n	0.5	l-o	0.0	f
31	Tartan	1.5	fl oz/1000 ft2	14 days	4.0	c-k	2.3	i-p	0.9	k-n	0.3	m-o	0.3	ef
30	Emerald	0.13	oz/1000 ft2	14 days	1.8	h-k	1.3	k-p	0.9	k-n	0.2	o	0.0	f
29	Interface	5	fl oz/1000 ft2	14 days	2.5	e-k	2.6	h-p	1.2	k-n	0.4	m-o	0.1	ef
7	Tourney	0.28	oz/1000 ft2	14 days	2.5	e-k	1.9	j-p	1.3	k-n	0.4	m-o	0.0	f
17	Honor	0.7	oz/1000 ft2	14 days	2.0	g-k	2.5	h-p	1.3	k-n	0.2	o	0.0	f
5	Banner Maxx	1	fl oz/1000 ft2	21 days	3.5	c-k	2.1	j-p	1.3	k-n	1.1	j-o	0.3	ef
28	Iprodione Pro 2SE	4	fl oz/1000 ft2	14 days	2.8	d-k	2.9	g-p	1.4	k-n	0.6	l-o	0.3	ef
21A	Triton Flo	0.5	fl oz/1000 ft2	14 days ^c	4.5	b-k	4.3	f-p	1.5	k-n	0.4	m-o	0.0	f
21A	Chipco Signature	4	oz/1000 ft2	14 days alt										
21B	Chipco Signature	4	oz/1000 ft2	14 days										
21B	Daconil Ultrex	3.2	oz/1000 ft2	14 days										
15	Trinity	1	fl oz/1000 ft2	14 days	3.0	c-k	2.5	h-p	1.8	k-n	0.6	l-o	0.2	ef
41	BAS 50017F	0.71	fl oz/1000 ft2	21 days	4.8	b-k	2.3	i-p	2.0	k-n	1.4	j-o	1.3	d-f
41	BAS 59516F	1	fl oz/1000 ft2	21 days										
13	Emerald	0.13	oz/1000 ft2	14 days	4.5	b-k	4.8	d-p	2.1	j-n	1.8	h-o	0.2	ef
12	Banner Maxx	0.82	fl oz/1000 ft2	21 days	6.0	b-h	3.3	g-p	2.4	j-n	1.7	i-o	0.3	ef
27	Interface	4	fl oz/1000 ft2	14 days	3.8	c-k	3.0	g-p	2.5	i-n	0.7	l-o	0.1	f
20	Triton Flo	0.75	fl oz/1000 ft2	14 days	5.5	b-j	4.0	f-p	2.5	i-n	0.9	k-o	0.1	f
43	Trinity	1	fl oz/1000 ft2	14 days	4.3	b-k	3.1	g-p	2.8	i-n	1.0	o-j	0.6	ef
42	BAS 50017F	0.54	fl oz/1000 ft2	14 days	3.3	c-k	3.8	g-p	3.1	i-n	1.1	j-o	0.0	f
26	Interface	3	fl oz/1000 ft2	14 days	4.5	b-k	4.8	d-p	4.0	g-n	1.9	h-o	0.0	f
1	Rubigan AS	0.5	fl oz/1000 ft2	14 days	3.5	c-k	4.5	e-p	4.3	f-n	3.3	e-o	3.0	c-f
3	Banner Maxx	0.5	fl oz/1000 ft2	14 days	4.0	c-k	4.5	e-p	4.5	e-n	2.5	f-o	0.8	ef
4	Rubigan AS	1	fl oz/1000 ft2	21 days	4.5	b-k	4.5	e-p	6.3	c-k	5.0	d-l	2.8	d-f

4	GWN-9812	0.74	fl oz/1000 ft2	21 days										
2	Rubigan AS	0.5	fl oz/1000 ft2	14 days	5.8	b-i	8.0	b-g	9.8	b-f	6.0	b-i	3.5	c-f
2	GWN-9812	0.74	fl oz/1000 ft2	14 days										
6	Rubigan AS	1	fl oz/1000 ft2	21days	7.8	a-d	7.8	c-h	10.0	b-e	6.8	b-f	2.5	d-f
44	Control				9.3	ab	9.8	b-e	12.5	ab	10.5	ab	9.8	b

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c The 14-day alternated treatments were applied as follows: part A on 8/20 and 9/17 and part B on 9/3.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 12. Preventive dollar spot study on a creeping bentgrass putting green, 2009.

Location: Hancock Turfgrass Research Center, East Lansing, MI

Rating Type: Turfgrass quality

Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Trt No.	Treatment Name	Rate	Unit	Application Interval	8/24/09		9/2/09		9/10/09		9/18/09		9/30/09	
					Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
23	Reserve	3.2	fl oz/1000 ft2	14 days	7.3	a-c	7.3	a-c	8.0	a	8.0	a	8.0	ab
19	Tartan	2	fl oz/1000 ft2	14 days	8.0	a	8.0	a	7.8	ab	8.0	a	7.8	a-c
22	Reserve	2.8	fl oz/1000 ft2	14 days	7.0	b-d	7.0	a-d	7.8	ab	7.5	a-c	7.5	a-d
24	Reserve	3.6	fl oz/1000 ft2	14 days	7.0	b-d	7.3	a-c	7.8	ab	7.8	ab	8.0	ab
18	Concert	4	fl oz/1000 ft2	14 days	6.8	b-e	7.3	a-c	7.3	a-d	7.5	a-c	8.0	ab
29	Interface	5	fl oz/1000 ft2	14 days	7.3	a-c	6.3	c-g	7.3	a-d	7.8	ab	8.0	ab
40	BAS 50017F	0.54	fl oz/1000 ft2	14 days	7.0	b-d	7.0	a-d	7.3	a-d	7.8	ab	7.3	b-e
40	BAS 59516F	1	fl oz/1000 ft2	14 days										
8	Tourney	0.37	oz/1000 ft2	14 days	7.3	a-c	7.3	a-c	7.0	a-e	7.0	b-e	7.3	b-e
14	Emerald	0.18	oz/1000 ft2	14 days	6.8	b-e	7.0	a-d	7.0	a-e	6.8	c-f	6.8	d-g
16	Honor	1.1	oz/1000 ft2	14 days	6.8	b-e	6.5	c-f	7.0	a-e	7.5	a-c	7.3	b-e
28	Iprodione Pro 2SE	4	fl oz/1000 ft2	14 days	7.0	b-d	6.3	c-g	7.0	a-e	7.0	b-e	7.3	b-e
20	Triton Flo	0.75	fl oz/1000 ft2	14 days	6.5	c-f	6.3	c-g	6.8	b-f	7.3	a-d	7.5	a-d
12	Banner Maxx	0.82	fl oz/1000 ft2	21 days	6.5	c-f	6.3	c-g	6.8	b-f	6.5	d-g	6.8	d-g
17	Honor	0.7	oz/1000 ft2	14 days	6.8	b-e	6.3	c-g	6.8	b-f	7.3	a-d	7.3	b-e
25	Concert	5	fl oz/1000 ft2	14 days	6.5	c-f	7.0	a-d	6.8	b-f	7.3	a-d	7.5	a-d
27	Interface	4	fl oz/1000 ft2	14 days	6.8	b-e	6.3	c-g	6.8	b-f	7.8	ab	8.0	ab

30	Emerald	0.13	oz/1000 ft2	14 days	6.8	b-e	6.5	c-f	6.8	b-f	7.3	a-d	7.3	b-e
5	Banner Maxx	1	fl oz/1000 ft2	21 days	6.5	c-f	6.8	b-e	6.5	c-g	6.8	c-f	6.8	d-g
21A	Triton Flo	0.5	fl oz/1000 ft2	14 days ^c	6.3	d-g	6.0	d-h	6.5	c-g	7.8	ab	8.0	ab
21A	Chipco Signature	4	oz/1000 ft2	14 days alt										
21B	Chipco Signature	4	oz/1000 ft2	14 days										
21B	Daconil Ultrex	3.2	oz/1000 ft2	14 days										
31	Tartan	1.5	fl oz/1000 ft2	14 days	7.0	b-d	6.8	b-e	6.5	c-g	6.8	c-f	7.3	b-e
41	BAS 50017F	0.71	fl oz/1000 ft2	21 days	6.5	c-f	7.0	a-d	6.5	c-g	6.8	c-f	6.8	d-g
41	BAS 59516F	1	fl oz/1000 ft2	21 days										
42	BAS 50017F	0.54	fl oz/1000 ft2	14 days	6.5	c-f	6.5	c-f	6.5	c-g	6.8	c-f	7.3	b-e
7	Tourney	0.28	oz/1000 ft2	14 days	6.5	c-f	6.3	c-g	6.3	d-h	6.5	d-g	7.0	c-f
26	Interface	3	fl oz/1000 ft2	14 days	6.3	d-g	6.0	d-h	6.3	d-h	7.5	a-c	7.5	a-d
43	Trinity	1	fl oz/1000 ft2	14 days	6.8	b-d	6.3	c-g	6.3	d-h	6.5	d-g	7.0	c-f
3	Banner Maxx	0.5	fl oz/1000 ft2	14 days	6.0	e-h	6.0	d-h	6.0	e-i	6.3	e-g	6.5	e-h
13	Emerald	0.13	oz/1000 ft2	14 days	6.8	b-e	6.0	d-h	6.0	e-i	6.3	e-g	6.8	d-g
1	Rubigan AS	0.5	fl oz/1000 ft2	14 days	6.0	e-h	6.0	d-h	5.8	f-j	6.0	f-h	5.8	hi
2	Rubigan AS	0.5	fl oz/1000 ft2	14 days	6.0	e-h	5.5	f-i	5.8	f-j	5.8	gh	6.0	gh
2	GWN-9812	0.74	fl oz/1000 ft2	14 days										
4	Rubigan AS	1	fl oz/1000 ft2	21 days	6.5	c-f	6.0	d-h	5.8	f-i	6.0	f-h	5.8	hi
4	GWN-9812	0.74	fl oz/1000 ft2	21 days										
15	Trinity	1	fl oz/1000 ft2	14 days	6.5	c-f	6.0	d-h	5.8	f-i	6.3	e-g	7.0	c-f
44	Control				6.0	e-h	5.5	f-i	5.3	h-j	5.3	h	4.8	j
6	Rubigan AS	1	fl oz/1000 ft2	21days	5.3	h	5.5	f-i	5.0	ij	6.0	f-h	6.5	e-h

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c The 14-day alternated treatments were applied as follows: part A on 8/20 and 9/17 and part B on 9/3.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Curative Dollar Spot (*Sclerotinia homoeocarpa*, *Rutstroemia floccosum*) 2009

Curative Dollar Spot Fairway Study, 2009

A curative dollar spot study was set up this year after a relatively uniform dollar spot outbreak on an annual bluegrass fairway at the Hancock Turfgrass Research Center on the campus of MSU, East Lansing, MI. The study included four replications of each treatment and was set up in a randomized complete block design. The plots measured

2' x 6'. Spray treatments were applied using a CO₂ backpack sprayer set at 38 psi with a single 8002E Tee Jet flat fan nozzle. Spray volume was 48 GPA. Plots were irrigated and fertilized as needed to maintain turf quality and vigor. Fungicide treatments were applied initially on 7/31/09 and re-applied at the intervals indicated in Tables 13 and 14. The 14-day treatments were re-applied on 8/13 and 8/25, unless otherwise indicated. The 21-day treatments were re-applied on 8/19. Data represent mean percent recovery calculated from the 7/31/09 pretreatment rating (Table 13.) Quality ratings were also taken using a 1 (worst) to 10 (excellent) scale, where 7 represents acceptable turf quality based on turf density and color (Table 14.) Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

The disease level in the study area averaged approximately 34% dollar spot on 7/31/09, which was the pretreatment rating date (data not shown). Within five weeks, many treatments had nearly or completely eradicated the dollar spot disease. Several proprietary treatments as well as Interface, Emerald, Tartan, Honor, Concert, Reserve, and Tourney all had more than 70% recovery at the trial's completion, with Interface (4 and 5 fl oz rate), Emerald (0.18 oz rate), Tartan (2 fl oz rate) and several proprietary products all providing more than 90% recovery by that time (Table 13.) The control plots experienced an increase in dollar spot level, which is not unexpected since dollar spot disease pressure typically builds from late July into late September. Overall turfgrass quality in the study was very low due to the tremendous amount of disease present which severely thinned many plots. This is demonstrated by the control plots averaging quality ratings between 2.0 and 4.0 during this study. Some of the treatments which provided the best turfgrass quality in this study include Interface, Tartan, Reserve and Emerald (Table 14.) No phytotoxicity was observed.

Table 13. Curative dollar spot study on an annual bluegrass fairway, 2009.

Location: Hancock Turfgrass Research Center, East Lansing, MI

Rating Type: Percent recovery calculated from 7/31/09 pretreatment rating.

Trt	Treatment		Rate	Application	8/7/09		8/12/09		8/23/09		9/6/09	
No.	Name	Rate	Unit	Interval	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD
29	Interface	5	fl oz/1000 ft ²	14 days	53.5	ab	71.9	a-d	82.4	a-d	100.0	a
27	Interface	4	fl oz/1000 ft ²	14 days	49.8	a-c	48.9	a-h	81.8	a-d	98.9	a
14	Emerald	0.18	oz/1000 ft ²	14 days	33.8	a-e	64.4	a-f	80.9	a-e	98.2	a
13	Emerald	0.13	oz/1000 ft ²	14 days	25.8	a-f	78.1	a-c	59.5	a-g	92.5	ab
19	Tartan	2	fl oz/1000 ft ²	14 days	21.8	a-g	50.9	a-h	45.7	a-i	90.8	a-c
21A	Triton Flo	0.5	fl oz/1000 ft ²	14 days ^c	12.1	b-k	42.3	a-j	26.4	e-p	84.0	a-d
21A	Chipco Signature	4	oz/1000 ft ²	14 days alt								
21B	Chipco Signature	4	oz/1000 ft ²	14 days								
21B	Daconil Ultrex	3.2	oz/1000 ft ²	14 days								
30	Emerald	0.13	oz/1000 ft ²	14 days	20.3	b-h	52.5	a-h	57.6	a-h	83.7	a-d
17	Honor	0.7	oz/1000 ft ²	14 days	46.1	a-c	68.7	a-e	53.9	a-h	81.5	a-d

25	Concert	5	fl oz/1000 ft2	14 days	18.3	b-i	53.2	a-h	43.0	b-k	81.2	a-d
40	BAS 50017F	0.54	fl oz/1000 ft2	14 days	14.0	b-k	42.0	a-k	39.4	b-m	79.1	a-e
40	BAS 59516F	1	fl oz/1000 ft2	14 days								
26	Interface	3	fl oz/1000 ft2	14 days	54.9	ab	69.4	a-e	42.9	b-k	78.6	a-e
16	Honor	1.1	oz/1000 ft2	14 days	33.4	a-e	59.2	a-g	31.4	d-n	77.5	a-f
18	Concert	4	fl oz/1000 ft2	14 days	26.5	a-f	44.9	a-i	37.4	b-m	73.6	a-h
31	Tartan	1.5	fl oz/1000 ft2	14 days	7.9	b-l	42.5	a-j	35.2	c-m	73.3	a-h
24	Reserve	3.6	fl oz/1000 ft2	14 days	5.4	b-l	47.1	a-h	45.4	a-i	72.1	a-h
23	Reserve	3.2	fl oz/1000 ft2	14 days	7.3	b-l	29.2	a-n	29.2	d-o	71.9	a-h
8	Tourney	0.37	oz/1000 ft2	14 days	20.8	a-g	35.2	a-m	36.4	b-m	71.8	a-h
22	Reserve	2.8	fl oz/1000 ft2	14 days	15.0	b-j	29.2	a-n	38.0	b-m	69.8	a-i
7	Tourney	0.28	oz/1000 ft2	14 days	1.3	c-m	28.8	a-n	46.3	a-j	69.4	a-i
20	Triton Flo	0.75	fl oz/1000 ft2	14 days	16.1	b-j	38.8	a-l	44.8	a-j	67.8	a-j
43	Trinity	1	fl oz/1000 ft2	14 days	14.8	b-j	16.8	b-o	40.2	b-m	63.2	a-k
15	Trinity	1	fl oz/1000 ft2	14 days	9.8	b-l	38.4	a-l	20.1	g-q	61.8	a-k
28	Iprodione Pro 2SE	4	fl oz/1000 ft2	14 days	10.0	b-l	20.0	a-o	33.6	c-n	61.6	a-k
42	BAS 50017F	0.54	fl oz/1000 ft2	14 days	21.7	a-g	38.8	a-l	27.5	d-o	57.5	a-l
41	BAS 50017F	0.71	fl oz/1000 ft2	21 days	36.1	a-d	40.5	a-l	19.8	g-q	48.6	c-n
41	BAS 59516F	1	fl oz/1000 ft2	21 days								
2	Rubigan AS	0.5	fl oz/1000 ft2	14 days	5.0	b-l	5.0	f-r	19.4	g-q	42.5	d-o
2	GWN-9812	0.74	fl oz/1000 ft2	14 days								
3	Banner Maxx	0.5	fl oz/1000 ft2	14 days	5.0	b-l	21.7	a-o	12.5	g-r	33.3	g-p
4	Rubigan AS	1	fl oz/1000 ft2	21 days	17.5	b-i	10.0	d-p	23.8	f-g	31.9	h-g
4	GWN-9812	0.74	fl oz/1000 ft2	21 days								
5	Banner Maxx	1	fl oz/1000 ft2	21 days	-6.4	d-n	-19.8	j-u	-21.4	n-t	15.9	l-s
1	Rubigan AS	0.5	fl oz/1000 ft2	14 days	-16.7	e-q	-22.9	l-u	-7.3	i-t	10.4	m-s
6	Rubigan AS	1	fl oz/1000 ft2	21 days	10.0	b-l	-32.7	o-u	-21.3	n-t	-4.6	p-t
12	Banner Maxx	0.82	fl oz/1000 ft2	21 days	1.4	c-m	-53.9	q-w	-9.8	j-t	-20.6	r-u
44	Control				-85.0	u-x	-105.8	wx	-111.0	w	-62.1	v

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c The 14-day alternated treatments were applied as follows: part A on 7/31 and 8/25 and part B on 8/13.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 14. Curative dollar spot study on an annual bluegrass fairway, 2009.

Location: Hancock Turfgrass Research Center, East Lansing, MI

Rating Type: Turfgrass quality

Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Rating Date						8/12/09		8/23/09		9/6/09	
Trt No.	Treatment Name	Form Type	Rate	Rate Unit	Application Interval	Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
29	Interface	SC	5	fl oz/1000 ft ²	14 days	5.8	a-d	6.8	ab	7.5	a
19	Tartan	SC	2	fl oz/1000 ft ²	14 days	4.5	e-i	6.0	b-e	6.8	a-d
27	Interface	SC	4	fl oz/1000 ft ²	14 days	5.3	b-f	6.3	a-d	6.8	a-d
14	Emerald	WDG	0.18	oz/1000 ft ²	14 days	5.3	b-f	6.0	b-f	6.5	a-e
21A	Triton Flo	SC	0.5	fl oz/1000 ft ²	14 days ^c	5.0	c-g	5.5	d-g	6.5	a-e
21A	Chipco Signature	WG	4	oz/1000 ft ²	14 days ALT						
21B	Chipco Signature	WG	4	oz/1000 ft ²	14 days						
21B	Daconil Ultrex	WDG	3.2	oz/1000 ft ²	14 days						
24	Reserve	SC	3.6	fl oz/1000 ft ²	14 days	4.8	d-h	5.3	e-h	6.5	a-e
30	Emerald	WDG	0.13	oz/1000 ft ²	14 days	5.3	b-f	6.0	b-e	6.5	a-e
7	Tourney	WDG	0.28	oz/1000 ft ²	14 days	4.3	f-j	5.0	f-i	6.3	b-f
17	Honor	WDG	0.7	oz/1000 ft ²	14 days	4.5	e-i	5.3	e-h	6.3	b-f
25	Concert	EC	5	fl oz/1000 ft ²	14 days	4.3	f-j	5.3	e-h	6.3	b-f
26	Interface	SC	3	fl oz/1000 ft ²	14 days	5.8	a-d	6.3	a-d	6.3	b-f
40	BAS 50017F	SC	0.54	fl oz/1000 ft ²	14 days	4.5	e-i	5.3	e-h	6.3	b-f
40	BAS 59516F	SC	1	fl oz/1000 ft ²	14 days						
13	Emerald	WDG	0.13	oz/1000 ft ²	14 days	5.5	a-e	5.8	c-f	6.0	c-g
16	Honor	WDG	1.1	oz/1000 ft ²	14 days	4.8	d-h	5.5	d-g	6.0	c-g
20	Triton Flo	SC	0.75	fl oz/1000 ft ²	14 days	4.8	d-h	5.3	e-h	6.0	c-g
22	Reserve	SC	2.8	fl oz/1000 ft ²	14 days	4.8	d-h	5.3	e-h	6.0	c-g
18	Concert	EC	4	fl oz/1000 ft ²	14 days	4.0	g-k	5.3	e-h	5.8	d-h
23	Reserve	SC	3.2	fl oz/1000 ft ²	14 days	4.0	g-k	5.0	f-i	5.8	d-h
28	Iprodione Pro 2SE	SE	4	fl oz/1000 ft ²	14 days	4.8	d-h	5.5	d-g	5.8	d-h
31	Tartan	SC	1.5	fl oz/1000 ft ²	14 days	4.5	e-i	5.3	e-h	5.8	c-h
42	BAS 50017F	SC	0.54	fl oz/1000 ft ²	14 days	4.5	e-i	5.0	f-i	5.8	d-h
43	Trinity	SC	1	fl oz/1000 ft ²	14 days	4.8	d-h	5.0	f-i	5.8	d-h
2	Rubigan AS	AS	0.5	fl oz/1000 ft ²	14 days	3.8	h-l	5.0	f-i	5.5	e-i
2	GWN-9812	L	0.74	fl oz/1000 ft ²	14 days						

41	BAS 50017F	SC	0.71	fl oz/1000 ft2	21 days	4.8	d-h	4.5	h-k	5.5	e-i
41	BAS 59516F	SC	1	fl oz/1000 ft2	21 days						
8	Tourney	WDG	0.37	oz/1000 ft2	14 days	4.3	f-j	5.0	f-i	5.3	f-j
15	Trinity	SC	1	fl oz/1000 ft2	14 days	4.5	e-i	4.8	g-j	5.3	f-j
1	Rubigan AS	AS	0.5	fl oz/1000 ft2	14 days	3.5	i-m	4.3	i-l	4.8	h-k
3	Banner Maxx	FL	0.5	fl oz/1000 ft2	14 days	4.7	d-h	4.8	g-j	4.8	h-k
4	Rubigan AS	AS	1	fl oz/1000 ft2	21 days	3.8	h-l	3.8	k-m	4.5	i-k
4	GWN-9812	L	0.74	fl oz/1000 ft2	21 days						
5	Banner Maxx	FL	1	fl oz/1000 ft2	21 days	3.5	i-m	3.3	m-o	4.5	i-k
6	Rubigan AS	AS	1	fl oz/1000 ft2	21days	3.8	i-m	3.3	m-o	4.3	j-l
12	Banner Maxx	SC	0.82	fl oz/1000 ft2	21 days	3.5	i-m	3.3	m-o	4.3	j-l
44	Control					2.0	o	2.3	p	3.3	lm

^a Mean of 4 replications.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

^c The 14-day alternated treatments were applied as follows: part A on 7/31 and 8/25 and part B on 8/13.

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

**2008 – 2009 Fungicide Report [Waitea Patch]
Department of Plant Pathology
Michigan State University**

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Waitea Patch/Brown Ring Patch (*Waitea circinata*), 2009

A curative Waitea patch study was conducted on an annual bluegrass putting green at Forest Akers East Golf Course, in East Lansing, MI. The study was set up in a randomized complete block design with four replicates of each treatment. Plots measured 2' x 6'. The green was maintained by golf course personnel who mowed, fertilized and irrigated the area using standard golf course practices. Treatments were applied using a CO₂-powered backpack sprayer with one TeeJet 8002E flat fan nozzle on a single-nozzle boom. Treatments were delivered in a spray volume of 96 GPA at 40 psi. Treatments were initially applied on 5/13/09. Those treatments on a 14-day application interval were reapplied on 5/27 and the 21-day interval treatments on 6/2. The 28-day interval treatments were only applied once due to a decline in disease pressure. For the data presented in Table 18, all treatments had received only one application prior to the 5/27/09 rating since re-applications for the 14-day and 21-day interval treatments occurred after the disease rating indicated. Plots were rated for percent area displaying Waitea Patch symptoms, with a pretreatment rating taken on 5/13/09 prior to treatment application. Percent recovery was calculated between the 5/27/09 rating date and the pretreatment rating taken on 5/13/09. Turfgrass quality was also rated using a 1 – 10 scale, where 1=poor, 7=acceptable, and 10=excellent (Table 19.) Turfgrass quality was a visual estimation of quality based on a combination of turfgrass color, density, and overall appearance. Data were analyzed using AOV and means separated with LSD (p=0.05).

Disease pressure in the study area was fairly consistent at the start of the study, with all plots exhibiting between 31-47% with no statistical differences among treatments (data not shown). Due to spontaneous permanent recovery in the study site, Reserve (3.6 fl oz/1000 ft²) was the only treatment tested to provide statistically significant disease recovery compared to the untreated control. There was a lack of statistical separation among treatment means that may be attributed to the control plots having exhibited nearly 60% recovery. Headway, Prostar, and Triton SC were among the treatments providing the best average turfgrass quality rating, with Headway being the only treatment to provide statistically better turfgrass quality than the controls. No phytotoxicity was observed in this study.

Table 18. 2009 Waitea Patch/Brown Ring Patch
 Location: Forest Akers G.C., East Lansing, MI
 Rating Type: Percent recovery from initial pretreatment rating on 5/13/09
 Rating Date: 5/27/09

Trt No.	Treatment Name	Form Type	Rate	Unit	Application Interval	Mean ^a	LSD ^b
15	Reserve	SC	3.6	fl oz/1000 ft2	14 days	92.6	a
18	Headway	ME	1.5	fl oz/1000 ft2	14 days	90.9	ab
22	Prostar 70WP	WP	3	oz/1000 ft2	14 days	86.0	ab
13	Reserve	SC	2.8	fl oz/1000 ft2	14 days	84.9	ab
1	Triton SC (Legacy F)	SC	0.503	fl oz/1000 ft2	21 days	80.6	ab
16	Reserve	SC	4.5	fl oz/1000 ft2	14 days	79.9	ab
19	Medallion	WG	0.25	oz/1000 ft2	14 days	78.1	abc
14	Reserve	SC	3.2	fl oz/1000 ft2	14 days	75.7	a-d
23	Chipco 26GT	FL	3	fl oz/1000 ft2	14 days	70.3	a-e
2	Triton SC (Legacy F)	SC	1.01	fl oz/1000 ft2	28 days	69.7	a-e
21	Heritage G	G	4	lb/1000 ft2	28 days	66.4	a-e
4	Banner Maxx	FL	0.82	fl oz/1000 ft2	21 days	62.5	a-e
24	Untreated Control					59.6	b-e
5	Banner Maxx	FL	1.6	fl oz/1000 ft2	28 days	47.4	cde
3	Triton SC (Legacy F)	SC	0.754	fl oz/1000 ft2	28 days	44.2	de
17	Concert	EC	5	fl oz/1000 ft2	14 days	42.5	e
20	Heritage G	G	2	lb/1000 ft2	14 days	40.9	e

^a Mean of 4 replicates.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.

Table 19. 2009 Waitea Patch/Brown Ring Patch
 Location: Forest Akers G.C., East Lansing, MI
 Rating Type: Turfgrass Quality
 Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.
 Rating Date: 5/27/09

Trt No.	Treatment Name	Form Type	Rate	Rate Unit	Application Interval	Mean ^a	LSD ^b
1	Triton SC (Legacy F)	SC	16	ml/100 m2	21 days	6.8	abc
2	Triton SC (Legacy F)	SC	32	ml/100 m2	28 days	6.0	d
3	Triton SC (Legacy F)	SC	24	ml/100 m2	28 days	6.5	bcd
4	Banner Maxx	FL	26	ml/ 100m2	21 days	6.3	cd
5	Banner Maxx	FL	51	ml/100 m2	28 days	6.0	d
13	Reserve	SC	2.8	fl oz/1000 ft2	14 days	6.8	abc
14	Reserve	SC	3.2	fl oz/1000 ft2	14 days	6.5	bcd
15	Reserve	SC	3.6	fl oz/1000 ft2	14 days	6.5	bcd
16	Reserve	SC	4.5	fl oz/1000 ft2	14 days	6.3	cd
17	Concert	EC	5	fl oz/1000 ft2	14 days	6.3	cd
18	Headway	ME	1.5	fl oz/1000 ft2	14 days	7.3	a
19	Medallion	WG	0.25	oz/1000 ft2	14 days	6.5	bcd
20	Heritage G	G	2	lb/1000 ft2	14 days	6.0	d
21	Heritage G	G	4	lb/1000 ft2	28 days	6.0	d
22	Prostar 70WP	WP	3	oz/1000 ft2	14 days	6.8	abc
23	Chipco 26GT	FL	3	fl oz/1000 ft2	14 days	6.3	cd
24	Untreated Control					6.3	cd

^a Mean of 4 replicates.

^b Means followed by same letter do not significantly differ (P=0.05, LSD).

Note: Proprietary treatments were included in the data analysis, but are not reported in this table.