

2006-2007 Fungicide Research Report

**Department of Plant Pathology
Michigan State University**

**J.M. Vargas, Jr., N.M. Dykema, and A.R. Detweiler,
R. Hafer, D. Plemmons, E. Galbraith,
K. Dykema, B. Doozan, and E. Largent**

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2006-2007 Snow Mold (*Typhula ishikariensis* and *T. incarnata*)

This corporation-sponsored snow mold fungicide field study was conducted during the fall and winter of 2006-2007 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. Liquid treatments were applied with a CO₂ backpack sprayer at a pressure of 36 psi and a spray volume of 100 GPA using a double-nozzle boom with 8002E flat fan Tee Jet nozzles, unless otherwise indicated in Table 1. Granular products were pre-weighed and hand-applied.

The late fall, early winter weather in Michigan, and much of the Midwest, was unusual in 2006. Mild temperatures and high amounts of rainfall in November, December and into early January are uncharacteristic for Gaylord, MI. Sustained snow cover on the plots lasted from mid-January, 2007 through late March, 2007. In a typical year, snow covers the plots from some time in November until late March/early April. The study was rated on March 25, 2007 following snow-cover melt-off. The predominant snow mold species infecting the plots was Microdochium patch (*Microdochium nivale*) with some gray snow mold (*Typhula ishikariensis* and *T. incarnata*) also present at lower levels in most plots.

Disease pressure was moderately light this year, with the controls averaging approximately 50% disease compared to more typical averages of 80-90% disease in the control (Table 1). When the study was initially set up and early treatments were applied, there was already some *Microdochium* patch activity on the site. This, combined with the later than average snow cover, provided excellent growing conditions for *Microdochium* patch. Overall, the plots exhibited more *Microdochium* patch this year than we typically see and less gray snow mold. Under these conditions, many stand alone and two-way tank mix treatments performed well, as did many single application-timing treatments. Low level disease pressure and some variability in disease pressure across replicated plots limited the statistical separation of the various treatments. In general, two- and three-way tank mixes provided good disease control both with and without split applications. One notable exception is Instrata which performed well in several split application combinations. Interestingly, Instrata was the only single application, non-tank mixed product that exhibited an average of less than 10% snow mold.

Overall turfgrass quality in the study area was acceptable, with no obvious phytotoxicity being observed (Table 2).

Treetops Snow Mold - 2006-2007

Table 1. Treetops Snow Mold - 2006-2007

Rating Date: March 25, 2007.

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	LSD
40A	Insignia 0.7 oz +	5-Oct +	0	0	0	0	0.0	j
40B	Manicure Ultra 5 oz + Revere 12 fl oz	25-Oct						
59	Chipco 26GT 8 fl oz + Daconil Ultrex 3.2 oz + PCNB 12 fl oz	25-Oct	0	0	0	0	0.0	j
54A	Instrata 5.5 fl oz +	5-Oct +	0	0.5	0	0	0.1	j
54B	Instrata 5.5 fl oz	25-Oct						
28	Tartan 2 fl oz + Daconil Ultrex 5 oz	25-Oct	1	0	0	0.3	0.3	j
41	18 Plus 4 fl oz + Manicure Ultra 5 oz + Revere 12 fl oz	25-Oct	0	1	0	0.3	0.3	j
56A	Instrata 3 fl oz +	5-Oct +	0	0.3	0.3	1	0.4	ij
56B	Instrata 9.3 fl oz	25-Oct						
55A	Instrata 7 fl oz +	5-Oct +	0.3	0.5	0.3	1	0.5	ij
55B	Instrata 7 fl oz	25-Oct						
37	Insignia 0.7 oz + Iprodione Pro 4 fl oz + Manicure 5 oz	25-Oct	0.3	1	0.5	0.5	0.6	ij
39	Insignia 0.7 oz + Revere 4 oz + Manicure 4 oz	25-Oct	0.5	1	0	1	0.6	ij
42A	Spectator Ultra 4 fl oz + Insignia 0.7 oz +	5-Oct +	2	0	1	0	0.8	ij
42B	Manicure Ultra 5 oz	25-Oct						
29	Tartan 2 fl oz + Turfcide 400F 6 fl oz	25-Oct	0.5	3	0	0	0.9	ij
46A	Spectro 4 oz +	5-Oct +	0.3	0.5	1	3	1.2	h-j
46B	26/36 4 fl oz + CLEXP-9 1.2 oz	25-Oct						
53A	Instrata 3 fl oz +	5-Oct +	0	1	1	3	1.3	h-j
53B	Instrata 8 fl oz	25-Oct						
49	26/36 4 fl oz + CLEXP-9 1.2 oz	25-Oct	3	1	1	0.5	1.4	g-j
22	Turfcide 400 9 fl oz + Daconil Ultrex 3.7 oz	25-Oct	5	0.5	0	0.5	1.5	g-j
52	Spectro 5.75 oz + CLEXP-9 1.2 oz	25-Oct	1	0	0	5	1.5	g-j
31	Tartan 2 fl oz + Moncut 70DF 2.2 oz	27-Oct	2	2	0.5	2	1.6	f-j
36	Insignia 0.7 oz + Revere 4 fl oz + Manicure 5 oz	25-Oct	7	1	0.3	1	2.3	f-j
48A	Spectro 4 oz +	5-Oct +	5	2	1	2	2.5	f-j

48B	26/36 4 fl oz + Endorse 4 oz	25-Oct							
43A	Spectator Ultra 4 fl oz +	5-Oct +	0.3	5	0.3	5	2.6	f-j	
43B	Revere 12 fl oz	25-Oct							
35	Instrata 9.3 fl oz	25-Oct	7	0.3	0.5	3	2.7	f-j	
30	Tartan 2 fl oz + Chipco 26GT 6 fl oz	25-Oct	10	2	0	0	3.0	f-j	
38	Insignia 0.7 oz + EXP 711 1 oz + Manicure 5 oz	25-Oct	1	1	0.3	10	3.1	f-j	
16	Instrata 3.61 SE 11 fl oz	25-Oct	10	0.5	0.3	2	3.2	f-j	
47A	Spectro 4 oz +	5-Oct +	7	3	1	5	4.0	f-j	
47B	26/36 4 fl oz + Daconil Weather Stik 5.5 fl oz	25-Oct							
58	Chipco 26GT 4 fl oz + Daconil Ultrex 3.2 oz + PCNB 6 fl oz	25-Oct	0.3	15	0	1	4.1	f-j	
50	26/36 4 fl oz + Daconil Weather Stik 5.5 fl oz	25-Oct	3	10	5	2	5.0	f-j	
19	Banner Maxx 1.3ME 2 fl oz + Turfcide 400 6 fl oz	25-Oct	5	2	5	10	5.5	f-j	
18	Banner Maxx 1.3ME 2 fl oz + Daconil Weather Stik 6F 5.5 fl oz	25-Oct	20	1	0.3	3	6.1	f-j	
51	26/36 4 fl oz + Endorse 4 oz	25-Oct	20	5	0.3	3	7.1	e-j	
26	Grigg 1-26-26 12 fl oz + Daconil Ultrex 3.2 oz + Medallion 0.5 oz	25-Oct	5	7	0.5	20	8.1	e-j	
45A	Armada 1.2 oz +	5-Oct +	0	30	0.3	3	8.3	e-j	
45B	Revere 4000 12 fl oz	25-Oct							
15	Instrata 3.61 SE 9 fl oz	25-Oct	25	3	1	5	8.5	e-j	
44A	Insignia 0.7 oz +	5-Oct +	0.5	30	0.5	3	8.5	e-j	
44B	18 Plus 4 fl oz + Manicure Ultra 5 oz	25-Oct							
27	Instrata 5.5 fl oz	25-Oct	2	30	3	5	10.0	e-j	
25	Grigg 1-26-26 6 fl oz + Daconil Ultrex 3.2 oz + Medallion 0.5 oz	25-Oct	20	20	0.5	3	10.9	e-j	
20	Turfcide 400 12 fl oz**apply in 217.8 GPA	25-Oct	10	3	0.5	40	13.4	e-j	
14	Instrata 3.61 SE 5 fl oz	25-Oct	50	5	0.5	2	14.4	d-i	
21	Turfcide 400 12 fl oz	25-Oct	30	30	1	0.5	15.4	d-g	
17	Medallion 50WP 0.15 oz + Daconil Weather Stik 6F 2.5 fl oz + Banner Maxx 1.3ME 1.8 fl oz	25-Oct	20	20	na	7	15.7	d-f	
10	V-10116 0.44 oz	25-Oct	25	15	7	35	20.5	de	
9	V-10116 0.37 oz	25-Oct	35	10	25	40	27.5	cd	
12	V10190 0.44 lb ai/A	25-Oct	60	40	5	35	35.0	c	
13	V10190 0.66 lb ai/A	25-Oct	80	35	2	35	38.0	bc	
60	Control	---	35	70	30	70	51.3	ab	

23	Grigg 1-26-26 6 fl oz	25-Oct	90	60	40	20	52.5	a
11	V10190 0.22 lb ai/A	25-Oct	65	75	50	35	56.3	a
24	Grigg 1-26-26 12 fl oz	25-Oct	65	75	20	65	56.3	a

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

Treetops Snow Mold - 2006-2007

Table 2. Treetops Snow Mold - 2006-2007

Rating Date: March 25, 2007.

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

	Treatment and Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean	LSD
28	Tartan 2 fl oz + Daconil Ultrex 5 oz	25-Oct	7	8	7	7	7.3	a
31	Tartan 2 fl oz + Moncut 70DF 2.2 oz	27-Oct	7	7	8	7	7.3	a
39	Insignia 0.7 oz + Revere 4 oz + Manicure 4 oz	25-Oct	7	7	8	7	7.3	a
59	Chipco 26GT 8 fl oz + Daconil Ultrex 3.2 oz + PCNB 12 fl oz	25-Oct	7	7	7	8	7.3	a
22	Turfcide 400 9 fl oz + Daconil Ultrex 3.7 oz	25-Oct	7	7	8	6	7.0	ab
29	Tartan 2 fl oz + Turfcide 400F 6 fl oz	25-Oct	7	7	7	7	7.0	ab
30	Tartan 2 fl oz + Chipco 26GT 6 fl oz	25-Oct	7	7	8	6	7.0	ab
36	Insignia 0.7 oz + Revere 4 fl oz + Manicure 5 oz	25-Oct	6	7	8	7	7.0	ab
40A	Insignia 0.7 oz +	5-Oct +	7	7	7	7	7.0	ab
40B	Manicure Ultra 5 oz + Revere 12 fl oz	25-Oct						
49	26/36 4 fl oz + CLEXP-9 1.2 oz	25-Oct	7	7	7	7	7.0	ab
37	Insignia 0.7 oz + Iprodione Pro 4 fl oz + Manicure 5 oz	25-Oct	7	7	7	6	6.8	a-c
38	Insignia 0.7 oz + EXP 711 1 oz + Manicure 5 oz	25-Oct	7	8	7	5	6.8	a-c
41	18 Plus 4 fl oz + Manicure Ultra 5 oz + Revere 12 fl oz	25-Oct	7	7	7	6	6.8	a-c
46A	Spectro 4 oz +	5-Oct +	7	7	7	6	6.8	a-c
46B	26/36 4 fl oz + CLEXP-9 1.2 oz	25-Oct						
48A	Spectro 4 oz +	5-Oct +	7	7	7	6	6.8	a-c
48B	26/36 4 fl oz + Endorse 4 oz	25-Oct						
52	Spectro 5.75 oz + CLEXP-9 1.2 oz	25-Oct	7	6	8	6	6.8	a-c

55A	Instrata 7 fl oz +	5-Oct +	7	7	6	7	6.8	a-c
55B	Instrata 7 fl oz	25-Oct						
58	Chipco 26GT 4 fl oz + Daconil Ultrex 3.2 oz + PCNB 6 fl oz	25-Oct	8	5	7	7	6.8	a-c
16	Instrata 3.61 SE 11 fl oz	25-Oct	6	7	7	6	6.5	a-d
42A	Spectator Ultra 4 fl oz + Insignia 0.7 oz +	5-Oct +	7	6	7	6	6.5	a-d
42B	Manicure Ultra 5 oz	25-Oct						
43A	Spectator Ultra 4 fl oz +	5-Oct +	7	6	7	6	6.5	a-d
43B	Revere 12 fl oz	25-Oct						
47A	Spectro 4 oz +	5-Oct +	6	7	7	6	6.5	a-d
47B	26/36 4 fl oz + Daconil Weather Stik 5.5 fl oz	25-Oct						
53A	Instrata 3 fl oz +	5-Oct +	7	6	7	6	6.5	a-d
53B	Instrata 8 fl oz	25-Oct						
54A	Instrata 5.5 fl oz +	5-Oct +	7	7	6	6	6.5	a-d
54B	Instrata 5.5 fl oz	25-Oct						
56A	Instrata 3 fl oz +	5-Oct +	7	6	6	7	6.5	a-d
56B	Instrata 9.3 fl oz	25-Oct						
35	Instrata 9.3 fl oz	25-Oct	6	7	6	6	6.3	a-e
50	26/36 4 fl oz + Daconil Weather Stik 5.5 fl oz	25-Oct	6	6	6	7	6.3	a-e
51	26/36 4 fl oz + Endorse 4 oz	25-Oct	5	7	7	6	6.3	a-e
15	Instrata 3.61 SE 9 fl oz	25-Oct	4	7	7	6	6.0	b-e
18	Banner Maxx 1.3ME 2 fl oz + Daconil Weather Stik 6F 5.5 fl oz	25-Oct	5	6	7	6	6.0	b-e
25	Grigg 1-26-26 6 fl oz + Daconil Ultrex 3.2 oz + Medallion 0.5 oz	25-Oct	5	5	7	7	6.0	b-e
45A	Armada 1.2 oz +	5-Oct +	7	4	7	6	6.0	b-e
45B	Revere 4000 12 fl oz	25-Oct						
20	Turfcide 400 12 fl oz**apply in 217.8 GPA	25-Oct	6	6	7	4	5.8	c-f
26	Grigg 1-26-26 12 fl oz + Daconil Ultrex 3.2 oz + Medallion 0.5 oz	25-Oct	6	6	7	4	5.8	c-f
27	Instrata 5.5 fl oz	25-Oct	6	5	6	6	5.8	c-f
44A	Insignia 0.7 oz +	5-Oct +	7	4	6	6	5.8	c-f
44B	18 Plus 4 fl oz + Manicure Ultra 5 oz	25-Oct						
19	Banner Maxx 1.3ME 2 fl oz + Turfcide 400 6 fl oz	25-Oct	4	6	6	6	5.5	d-f

21	Turfcide 400 12 fl oz	25-Oct	5	4	6	7	5.5	d-f
14	Instrata 3.61 SE 5 fl oz	25-Oct	3	6	6	6	5.3	ef
17	Medallion 50WP 0.15 oz + Daconil Weather Stik 6F 2.5 fl oz + Banner Maxx 1.3ME 1.8 fl oz	25-Oct	4	5	na	5	4.7	fg
9	V-10116 0.37 oz	25-Oct	3	5	5	3	4.0	gh
10	V-10116 0.44 oz	25-Oct	4	4	5	3	4.0	gh
12	V10190 0.44 lb ai/A	25-Oct	2	4	6	3	3.8	gh
13	V10190 0.66 lb ai/A	25-Oct	2	3	6	4	3.8	gh
60	Control	---	4	3	4	3	3.5	gh
23	Grigg 1-26-26 6 fl oz	25-Oct	1	3	5	4	3.3	h
11	V10190 0.22 lb ai/A	25-Oct	2	3	4	3	3.0	h
24	Grigg 1-26-26 12 fl oz	25-Oct	3	2	4	3	3.0	h

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

Anthracnose (*Colletotrichum graminicola*)

Crown Rot Anthracnose Study

A crown rot anthracnose study was set up on an annual bluegrass green at the Hancock Turfgrass Research Center, E. 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 6" alleys. Treatments were applied preventively using a CO₂ backpack sprayer at 42 PSI and 96 GPA with a single 8002E Tee Jet flat fan nozzle. The annual bluegrass study area was inoculated with *Colletotrichum graminicola* grown on sand/cornmeal using a drop spreader on 5/24, 6/4, 6/8, and 7/13. Plots were fertilized at a rate of 0.25 lbs N/1000 ft²/month using Country Club 18-3-12. Treatments were applied beginning on 6/20/07, unless otherwise noted in Table 3. Subsequent applications of the 14-day treatments were made on 7/2, 7/17, 7/31, 8/13, and 8/31 unless noted in Table 3. All other treatments were applied as noted in Table 3. The entire study was treated with Emerald (0.13 oz and 0.18 oz/1000 sq ft) for the control of dollar spot on 6/11 and 8/5, respectively. Quality ratings were taken using a 1-10 scale where 1 = poor, 7 = acceptable, and 10 = excellent turf quality (Table 3.) Data were analyzed using ANOVA and means separated by LSD (p=0.05).

Crown rot anthracnose disease began to develop near the edges of the study site in early July, but the disease never developed throughout the entire study area. The small amount of disease that began to develop subsided as the summer passed. As a result, no disease data are available for the crown rot anthracnose study for 2007. However, quality differences were observed, so quality ratings were taken in late July and mid August. Many treatments provided turf quality that was

significantly better than the untreated control, including several Tartan treatments at various rates or in combinations, Lynx, and Disarm combinations (Table 3.)

Table 3. Quality Rating on Crown Rotting Anthracnose Study, 2007.
Location: Hancock Turfgrass Research Center, E. Lansing, MI.
Rating Scale: 1-10, where 1 = poor, 7 = acceptable, and 10 = excellent.

Trt #	Treatment and Rate/1000 sq ft	Appl. Timing	July 27		Aug 14	
			Mean ^a	LSD ^b	Mean	LSD
17	Tartan 2 fl oz	14	7.3	ab	8.0	a
18	Tartan 2 fl oz + Signature 4 oz	14	7.3	ab	7.8	ab
11	Proprietary					
14	Proprietary					
16	Tartan 1.5 fl oz	14	7.0	bc	7.5	a-c
26	Tartan II 1.3 fl oz	14	7.3	ab	7.3	a-d
2	Trinity 1.0 fl oz	14	6.8	cd	7.3	a-d
24	Lynx SC 1 fl oz	14	7.0	bc	7.3	a-d
25	Tartan II 1 fl oz	14	7.3	ab	7.3	a-d
27	Tartan II 1.9 fl oz	14 ^c	7.3	ab	7.3	a-d
28	Lynx Fungicide 0.75 fl oz	14	7.0	bc	7.3	a-d
42	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	7.5	a	7.3	a-c
43	Disarm 480SC 0.18 fl oz + Manicure Ultra 3.25 oz	14	7.3	ab	7.3	a-d
55A	Rhapsody 5 fl oz ^f	14	7.0	bc	7.3	a-d
55B	Banner Maxx 1 fl oz ^f	14				
9A	ARY 0534002 SC 0.44 fl oz ALT W/	14 ALT	7.0	bc	7.0	b-e
9B	Lynx 45WP 0.26 oz	14				
15A	Signature 4 oz + Chipco 26GT 4 fl oz	20-Jun	7.0	bc	7.0	b-e
15B	Signature 4 oz + Compass WP 0.25 oz	3-Jul				
15C	Signature 4 oz + Lynx Fungicide 1.5 fl oz	17-Jul				
15D	Signature 4 oz + Tartan 2 fl oz	31-Jul				
15E	Signature 4 oz + Chipco 26GT 4 fl oz	14-Aug				
15F	Signature 4 oz + Compass WP 0.25 oz	28-Aug				
31	3336 PLUS 4 fl oz	14	7.0	bc	7.0	b-e

36	Spectro 90 5.75 oz	14	7.0	bc	7.0	b-e
46	Cleary 3336F 6 fl oz	14	7.0	bc	7.0	b-e
48	Proprietary					
52	Instrata 4 fl oz	14	7.0	bc	7.0	b-e
3	Insignia 0.5 oz + Trinity 1.0 fl oz	14	7.0	bc	6.8	c-f
5	V10116 0.44 oz	14	6.3	e	6.8	c-f
7	ARY 0534002 SC 0.44 fl oz	14	7.0	bc	6.8	c-f
12	Proprietary					
13	Proprietary					
19	Headway 1.5 fl oz	14	6.8	cd	6.8	c-f
20	Lynx Fungicide 1.5 fl oz	14 ^d	7.0	bc	6.8	c-f
22	Lynx Fungicide 1 fl oz + Signature 4 oz	14	7.3	ab	6.8	c-f
30	Nativo 1.2 fl oz	14	6.8	cd	6.8	c-f
32	3336 PLUS 4 fl oz + Daconil Ultrex 3.2 oz	14	7.0	bc	6.8	c-f
33	3336 PLUS 2 fl oz + Daconil Ultrex 3.2 oz	14	7.0	bc	6.8	c-f
35	CLEXP-9 0.6 oz	14	6.8	cd	6.8	c-f
44	Twosome 2 fl oz	14	7.0	bc	6.8	c-f
47	Banner Maxx 2 fl oz	14	7.0	bc	6.8	c-f
50	Proprietary					
51	Proprietary					
53	Concert 5.4 fl oz	14	7.0	bc	6.8	c-f
1	Insignia 0.9 oz	14	7.0	bc	6.5	d-f
4	V10116 0.37 oz	14	6.5	de	6.5	d-f
8	Disarm 480 SC 0.18 fl oz + ARY 047005 1.8 fl oz	14	6.8	cd	6.5	d-f
21	Lynx Fungicide 2 fl oz	21 ^e	7.0	bc	6.5	d-f
23A	Lynx Fungicide 1.5 fl oz + Signature 4 oz ALT W/	14 ALT	7.3	ab	6.5	d-f
23B	Signature 4 oz + Daconil Ultrex 3.2 oz	14				
29	Nativo 0.6 fl oz	14	7.0	bc	6.5	d-f
34	CLEXP-18 5.75 oz	14	7.3	ab	6.5	d-f
45	Twosome 4 fl oz	14	7.0	bc	6.5	d-f
49	Proprietary					
54	Medallion 0.25 oz	14	7.0	bc	6.5	d-f
56	Rhapsody 5 fl oz	14	6.8	cd	6.5	d-f
59	ARY 0534003 3.5 oz	14	7.0	bc	6.5	d-f

10A	Disarm 480SC 0.18 fl oz ALT W/	14 ALT	7.3	ab	6.3	e-g
10B	Lynx 45WP 0.26 oz	14				
37	Proprietary					
38	Proprietary					
57	Control	---	7.0	bc	6.3	e-g
58	Proprietary					
6	Disarm 480SC 0.36 fl oz	14	7.0	bc	6.0	fg
39	Proprietary					
41	Spectator Ultra 2 fl oz + Manicure Ultra 5 oz	14	7.0	bc	6.0	e-g
40	Proprietary					

^a Represents the mean of 4 replicate plots.

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

^c Treatment applied on 6/20, 7/2, and 7/17 only.

^d Treatment applied on 6/20, 7/2, 7/17, and 7/31 only.

^e Treatment applied on 6/20, 7/2 (1 week earlier than 21 days), and 7/31.

^f Treatment applied to same plots separately (in different tanks.)

Foliar Anthracnose Fairway Study.

A preventative foliar anthracnose study was set up on an annual bluegrass fairway at the Hancock Turfgrass Research Center, E. Lansing, MI. The study was set up in a randomized complete block design with 4 replicates of each treatment. Plots measured 6' x 9'. 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. The annual bluegrass study area was inoculated with *Colletotrichum graminicola* grown on sand/cornmeal using a drop spreader on 5/29, 6/4, and 7/5. Plots were fertilized at a rate of 0.2 lb N/1000 ft²/month. The entire study area was treated with Emerald (0.13 oz and 0.18 oz/1000 sq ft) for dollar spot control on 6/11 and 8/5, respectively. Treatments were applied beginning on 6/20/07, or as otherwise noted in Tables 4 and 5. Subsequent applications of the 14-day treatments were made on 7/6, 7/18, 8/2, and 8/15, or as shown in Tables 4-5. The 21-day treatments were reapplied on 7/12 and 8/2. Plots were rated by visual estimation of percent area infected with anthracnose (Table 4). Quality ratings were taken using a 1-10 scale where 1 = poor, 7 = acceptable, and 10 = excellent turf quality (Table 5.) Data were analyzed using ANOVA and means separated by LSD (p=0.05).

Foliar anthracnose developed in the study area at a low level, with the controls reaching their highest average infection rating of 10% on Aug 14. Most fungicides tested in this study provided statistically significant anthracnose control when compared to the untreated control plots for all of the ratings taken through Aug 14. By the Aug 24 rating date, disease pressure subsided and no treatment differences were observed between the untreated control and most treatments. Unfortunately, with disease pressure relatively low, separation of fungicide efficacy and dose effects were not possible in this test. Quality ratings

were also taken in this trial, and quality differences between many fungicides were observed (Table 5.) Among the treatments that provided acceptable turf quality for the entire duration of the study was Disarm, alone and in combinations (with Manicure Ultra or Spectator Ultra), Insignia, and Lynx Fungicide. Mild phytotoxicity, displayed as a yellowing of the turf, was exhibited by the V10116 treatments. No other phytotoxicity was observed during this anthracnose study.

Table 4. Foliar Anthracnose Study, 2007.

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

Rating Scale: Mean percent plot area infected with anthracnose.

Trt #	Treatment and Rate/1000 sq ft	Appl. Interval	Jul 24		Aug 2		Aug 14		Aug 24	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD
2	Trinity 1.0 fl oz	14	0.3	def	0.1	e	0.0	c	0.3	d
3	Insignia 0.5 oz + Trinity 1.0 fl oz	14	0.0	f	0.0	e	0.0	c	0.0	d
7	ARY 0534002 SC 0.44 fl oz	14	0.3	d-f	0.1	e	0.0	c	0.0	d
8	Disarm 480 SC 0.18 fl oz + ARY 047005 1.8 fl oz	14	0.0	f	0.0	e	0.0	c	0.8	cd
9A	ARY 0534002 SC 0.44 fl oz ALT W/	14 ALT	0.3	d-f	0.3	de	0.0	c	0.0	d
9B	Lynx 45WP 0.26 oz	14								
10A	Disarm 480SC 0.18 fl oz ALT W/	14 ALT	0.1	ef	0.0	e	0.0	c	0.0	d
10B	Lynx 45WP 0.26 oz	14								
11	Tartan 1 fl oz	21	0.3	d-f	0.3	e	0.0	c	0.0	d
12	Tartan 1.5 fl oz	21	0.0	f	0.1	e	0.0	c	0.0	d
13	Headway 1.5 fl oz	21	0.3	d-f	0.3	e	0.0	c	0.0	d
14	Compass WG 0.125 oz	14	0.4	d-f	0.3	de	0.0	c	0.0	d
15	Proprietary									
16	Lynx Fungicide 1.5 fl oz	21	0.1	ef	0.1	e	0.0	c	0.0	d
18	Lynx Fungicide 1 fl oz + Signature 4 oz	21	0.0	f	0.0	e	0.0	c	0.0	d
19A	Lynx Fungicide 1.5 fl oz + Signature 4 oz ALT W/	21 ALT	0.0	f	0.1	e	0.0	c	0.5	cd
19B	Signature 4 oz + Daconil Ultrex 3.2 oz	21								
20	Lynx Fungicide 1 fl oz	21	0.0	f	0.0	e	0.0	c	0.0	d
22	3336 PLUS 4 fl oz + Daconil Ultrex 3.2 oz	14	0.0	f	0.0	e	0.0	c	0.0	d
24	CLEXP-18 5.75 fl oz	14	0.4	d-f	0.1	e	0.0	c	0.3	d
25	CLEXP-9 0.6 oz	14	0.3	d-f	0.3	e	0.0	c	0.1	d
26	Spectro 90 5.75 oz	14	0.2	d-f	0.1	e	0.0	c	0.1	d
30	Proprietary									

32	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	0.0	f	0.0	e	0.0	c	0.0	d
34	Twosome 2 fl oz	14	0.4	d-f	0.3	e	0.0	c	0.6	cd
35	Twosome 4 fl oz	14	0.1	ef	0.1	e	0.0	c	0.1	d
36	Instrata 4 fl oz	14	0.0	f	0.1	e	0.0	c	0.0	d
40	Banner Maxx 2 fl oz	14	0.0	f	0.0	e	0.0	c	0.0	d
41A	Rhapsody 5 fl oz ^c	14	1.3	b-e	1.3	b-d	0.0	c	0.0	d
41B	Banner Maxx 1 fl oz ^c	14								
45	ARY 0534003 3.5 fl oz	14	0.3	d-f	0.1	e	0.0	c	0.0	d
1	Insignia 0.9 oz	14	0.1	ef	0.1	e	0.1	c	0.2	d
17	Lynx Fungicide 2 fl oz	21	0.0	f	0.0	e	0.1	c	0.2	d
33	Disarm 480SC 0.18 fl oz + Manicure Ultra 3.25 oz	14	0.5	d-f	0.5	de	0.1	c	0.0	d
5	V10116 0.44 oz	14	0.4	d-f	0.4	de	0.1	c	0.3	d
21	3336 PLUS 4 fl oz	14	0.3	d-f	0.3	e	0.1	c	0.3	d
29	Proprietary									
39	Cleary 3336 F 3 fl oz	14	0.2	d-f	0.2	e	0.2	c	0.0	d
4	V10116 0.37 oz	14	0.3	d-f	0.0	e	0.3	c	0.0	d
6	Disarm 480SC 0.36 fl oz	14	0.1	ef	0.0	e	0.3	c	0.3	d
23	3336 PLUS 2 fl oz + Daconil Ultrex 3.2 oz	14	1.4	b-d	0.3	e	0.3	c	0.2	d
27	Proprietary									
31	Spectator Ultra 2 fl oz + Manicure Ultra 5 oz	14	0.3	d-f	0.1	e	0.3	c	0.0	d
37	Concert 5.4 fl oz	14	0.2	ef	0.1	e	0.3	c	1.4	cd
38	Medallion 0.25 oz	14	0.4	d-f	0.3	e	0.9	c	0.0	d
28	Proprietary									
43	Control	---	3.3	a	2.8	a	10.0	b	3.0	b-d
42	Rhapsody 5 fl oz	14	2.2	a-c	2.2	ab	11.0	b	6.3	b
44	Proprietary									

^a Represents the mean of 4 replicate plots.

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

^c Treatment applied to same plots separately (in different tanks.)

Table 5. Quality Rating on Foliar Anthracnose Study, 2007.
Location: Hancock Turfgrass Research Center, MSU, E. Lansing, MI.
Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Trt #	Treatment and Rate/1000 sq ft	Appl. Interval	Jul 24		Aug 2		Aug 14		Aug 24	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD
6	Disarm 480SC 0.36 fl oz	14	7.0	b-d	7.3	ab	7.5	a	7.0	ab
17	Lynx Fungicide 2 fl oz	21	7.8	a	7.8	a	7.5	a	7.3	a
33	Disarm 480SC 0.18 fl oz + Manicure Ultra 3.25 oz	14	6.8	c-e	7.0	bc	7.5	a	7.3	a
16	Lynx Fungicide 1.5 fl oz	21	7.8	a	7.0	bc	7.3	ab	6.8	a-c
19A	Lynx Fungicide 1.5 fl oz + Signature 4 oz ALT W/	21 ALT	7.3	a-c	7.3	ab	7.3	ab	6.5	a-d
19B	Signature 4 oz + Daconil Ultrex 3.2 oz	21								
32	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	7.3	a-c	7.3	ab	7.3	ab	7.0	ab
1	Insignia 0.9 oz	14	7.0	b-d	7.0	bc	7.0	a-c	7.0	ab
10A	Disarm 480SC 0.18 fl oz ALT W/	14 ALT	6.5	d-f	7.0	bc	7.0	a-c	6.0	c-e
10B	Lynx 45WP 0.26 oz	14								
12	Tartan 1.5 fl oz	21	7.3	a-c	7.3	ab	7.0	a-c	6.3	b-d
18	Lynx Fungicide 1 fl oz + Signature 4 oz	21	7.3	a-c	7.0	bc	7.0	a-c	6.3	b-d
22	3336 PLUS 4 fl oz + Daconil Ultrex 3.2 oz	14	6.8	c-e	7.0	bc	7.0	a-c	6.5	a-d
37	Concert 5.4 fl oz	14	6.3	e-g	6.5	cd	7.0	a-c	6.3	b-d
45	ARY 0534003 3.5 fl oz	14	6.3	e-g	6.8	bc	7.0	a-c	6.5	a-d
7	ARY 0534002 SC 0.44 fl oz	14	6.5	d-f	6.5	cd	6.8	a-d	6.5	a-d
8	Disarm 480 SC 0.18 fl oz + ARY 047005 1.8 fl oz	14	7.5	ab	7.0	bc	6.8	a-d	6.8	a-c
11	Tartan 1 fl oz	21	6.8	c-e	7.0	bc	6.8	a-d	6.3	b-d
13	Headway 1.5 fl oz	21	6.8	c-e	6.8	bc	6.8	a-d	6.3	b-d
20	Lynx Fungicide 1 fl oz	21	7.5	ab	7.3	ab	6.8	a-d	5.8	d-f
21	3336 PLUS 4 fl oz	14	6.8	c-e	6.5	cd	6.8	a-d	6.5	a-d
23	3336 PLUS 2 fl oz + Daconil Ultrex 3.2 oz	14	6.5	d-f	6.8	bc	6.8	a-d	7.0	ab
24	CLEXP-18 5.75 fl oz	14	6.5	d-f	6.8	bc	6.8	a-d	6.5	a-d
26	Spectro 90 5.75 oz	14	6.8	c-e	6.5	cd	6.8	a-d	6.0	c-e
29	Proprietary									

40	Banner Maxx 2 fl oz	14	6.5	d-f	6.8	bc	6.8	a-d	6.5	a-d
41A	Rhapsody 5 fl oz ^c	14	6.8	c-e	6.8	bc	6.8	a-d	6.8	a-c
41B	Banner Maxx 1 fl oz ^c	14								
15	Proprietary									
25	CLEXP-9 0.6 oz	14	6.5	d-f	7.0	bc	6.5	b-e	6.3	b-d
27	Proprietary									
30	Proprietary									
34	Twosome 2 fl oz	14	6.5	d-f	6.8	bc	6.5	b-e	6.0	c-d
35	Twosome 4 fl oz	14	6.8	c-e	6.8	bc	6.5	b-e	6.8	a-c
38	Medallion 0.25 oz	14	6.8	c-e	7.0	bc	6.5	b-e	6.3	b-d
39	Cleary 3336F 3 fl oz	14	6.3	e-g	6.5	cd	6.5	b-e	6.0	c-e
3	Insignia 0.5 oz + Trinity 1.0 fl oz	14	7.0	b-d	7.0	bc	6.3	c-e	6.3	b-d
9A	ARY 0534002 SC 0.44 fl oz ALT W/	14 ALT	7.3	a-c	7.0	bc	6.3	c-e	6.5	a-d
9B	Lynx 45WP 0.26 oz	14								
14	Compass WG 0.125 oz	14	6.5	d-f	6.5	cd	6.3	c-e	6.5	a-d
28	Proprietary									
31	Spectator Ultra 2 fl oz + Manicure Ultra 5 oz	14	6.0	fg	6.5	cd	6.3	c-e	7.0	ab
36	Instrata 4 fl oz	14	6.8	c-e	6.5	cd	6.3	c-e	6.3	b-d
2	Trinity 1.0 fl oz	14	6.3	e-g	6.0	de	6.0	d-f	5.8	d-f
4	V10116 0.37 oz	14	5.8	g	5.5	e	5.8	ef	6.0	c-e
44	Proprietary									
5	V10116 0.44 oz	14	6.0	fg	6.0	de	5.3	f	5.8	d-f
42	Rhapsody 5 fl oz	14	6.0	fg	6.0	de	5.3	f	5.0	fg
43	Control	---	5.8	g	6.0	de	5.3	f	5.3	e-g

^a Represents the mean of 4 replicate plots.

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

^c Treatment applied to same plots separately (in different tanks.)

Summer Patch (*Magnaporthe poae*)

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. Treatments were applied preventively unless otherwise noted in Tables 6 and 7. The treatments that were applied when the soil temperature at 2" soil depth was 65° were initiated on April 30. The treatments that were initially applied when the soil temperature was 75° at 2" depth were applied beginning on May 21. Subsequent reapplications were made at intervals listed in Tables 6 and 7. An average of 0.3 lb nitrogen/1000 sq ft/month using Country Club (18-3-12) was applied to the study in ¼ lb nitrogen applications on the following dates: 5/7, 5/21, 6/11, 6/25, 7/9, 8/15 . The entire study area was background sprayed with Banol (1.5 fl oz/1000 sq ft) and Chipco 26GT (2 fl oz/1000 sq ft) to control dollar spot, brown patch, and Pythium blight on August 2. Data represent percent plot area diseased (Table 6). Quality ratings are provided in Table 7. 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).

Summer patch pressure was heavy in the trial this year, with disease in the untreated control plots peaking at 45% by the Aug 30 rating date. Several treatments provided excellent control, particularly CLEXP-9, Lynx Fungicide, Tartan, Endorse, and Headway through the Aug 15 rating. CLEXP-9 was the only treatment tested in the study that kept the plots disease-free through the Aug 30 rating. Although many treatments provided summer patch control that was statistically significant compared to the untreated control, the level of control provided was not acceptable by golf course standards. This is especially true in the Aug 30 rating. CLEXP-9 was the only treatment tested here that provided turfgrass quality that was not only acceptable ("7" rating), but was superior (averaged greater than "7") for the entire duration of the disease trial. Lynx, Endorse, and Headway were the only other treatments tested that provided an average turf quality rating that was considered acceptable ("7" or better) through the Aug 15 rating. Most treatments exhibited a significant decline in turf quality as the study progressed, with a majority of treatments tested providing unacceptable turf quality by the Aug 30 rating. No phytotoxicity was observed in the study this year.

Table 6. Summer Patch, 2007.

Location: Dearborn Country Club, Dearborn, MI.

Rating Scale: Mean percent plot area infected with summer patch.

Trt #	Treatment and Rate/1000 sq ft	Application Interval (Days) ^a	Jul 23		Aug 1		Aug 15		Aug 30	
			Mean ^b	LSD ^c	Mean	LSD	Mean	LSD	Mean	LSD
25	CLEXP-9 1.2 oz	75 + 21	0.8	hi	0.0	g	0.0	q	0.0	n
40	Proprietary									
17	Lynx Fungicide 1.5 fl oz	75 + 30	0.0	i	0.0	g	5.0	l-q	15.5	l-n
11	Lynx Fungicide 0.75 fl oz	65 + 30 + 30	0.8	hi	0.0	g	3.3	n-q	16.8	k-n
12	Lynx Fungicide 1.5 fl oz	65 + 30 + 30	0.0	i	0.0	g	11.0	j-q	18.3	j-n

13	Tartan II 2 fl oz	65 + 30 + 30	0.8	hi	0.3	fg	5.3	l-q	21.5	i-m
18	Tartan II 2 fl oz	75 + 30	0.8	hi	0.0	g	10.0	k-q	23.3	h-m
27	Endorse 4 oz	75 + 14	0.3	i	0.0	g	2.5	o-q	24.3	g-m
30	Headway 3 fl oz	65 + 21 + 21	1.3	hi	0.0	g	7.3	k-q	26.3	f-m
2	Insignia 0.5 oz + Trinity 1.5 fl oz	75 + 30	0.3	i	1.8	d-g	17.3	f-q	28.8	e-l
9	Tartan 2 fl oz	65 + 30 + 30	8.6	b-i	4.0	d-g	18.5	f-q	30.0	d-l
26	Endorse 4 oz	75 + 21	5.5	d-i	1.3	e-g	11.8	j-q	30.0	d-l
10	Bayleton 1.5 fl oz	65 + 30 + 30	5.1	e-i	1.9	d-g	21.8	d-o	30.5	c-l
7	Proprietary									
31	Headway 3 fl oz	75 + 21 + 21	0.0	i	0.0	g	4.0	m-q	31.3	c-l
5	Proprietary									
20	Compass WG 0.11 oz	65 + 30 + 30 + 30	13.8	a-g	7.5	c-g	38.8	a-e	33.8	b-l
45	Proprietary									
19	Headway 2 fl oz	75 + 30	2.8	g-i	2.5	d-g	22.5	d-n	36.3	b-k
3	Trinity 2.0 fl oz	75 + 30	0.8	hi	0.3	fg	24.3	c-l	37.5	a-j
29	Instrata 6 fl oz	75 + 21 + 21	0.0	i	0.0	g	8.0	k-q	37.5	a-i
35	Proprietary									
1	Insignia 0.9 oz	75 + 30	18.3	ab	9.0	b-g	30.0	a-j	38.8	a-i
41	Proprietary									
49	Proprietary									
16	Lynx Fungicide 0.75 fl oz	75 + 30	0.8	hi	0.0	g	18.8	f-q	40.0	a-i
48	Proprietary									
6	Proprietary									
14	Tartan 2 fl oz	75 + 30	14.8	a-f	17.3	ab	36.3	a-f	41.3	a-i
28	Instrata 6 fl oz	65 + 21 + 21	0.3	i	0.3	fg	24.3	c-l	41.3	a-i
38	Proprietary									
15	Bayleton 1.5 fl oz	75 + 30	3.5	f-i	10.5	a-d	32.5	a-h	43.8	a-g
23	3336 PLUS 6 fl oz	75 + 21	4.3	f-i	0.5	fg	30.5	b-j	43.8	a-g
42	Proprietary									
34	Control	---	11.3	a-i	10.0	a-e	41.3	a-d	45.0	a-g
36	Proprietary									

8	Proprietary									
21	Compass WG 0.25 oz	65 + 30 + 30 + 30	17.0	a-c	13.5	a-c	40.5	a-e	46.3	a-e
32	DeFenseman 0.35 lbs + Floradox Pro 1.5 fl oz	65 + 30 + 14	2.8	g-i	9.3	b-f	43.8	a-c	46.3	a-e
33	Banner Maxx 4 fl oz	75 + 28	3.0	g-i	0.0	g	23.0	d-m	46.3	a-e
22	Compass WG 0.39 oz	65 + 30 + 30 + 30	18.8	ab	15.0	a-c	43.8	ab	47.5	a-e
39	Proprietary									
43	Proprietary									
4	Proprietary									
44	Proprietary									
46	Proprietary									
24	3336F 8 fl oz	75 + 21	5.8	c-i	10.5	a-d	35.0	a-g	51.3	ab
37	Proprietary									
47	Proprietary									

^a Application intervals listed were applied on the following dates:

Application Interval Listed	Application Dates
75 + 30	5/21, 6/22
65 + 30 + 30	4/30, 5/30, 6/25
65 + 30 + 30 + 30	4/30, 5/30, 6/25, 7/23
75 + 21	5/21, 6/11, 7/2, 7/23
65 + 21 + 21	4/30, 5/21, 6/11
75 + 14	5/21, 6/6, 6/22, 7/2, 7/16, 8/1
75 + 21 + 21	5/21, 6/11, 7/2
65 + 30 + 14	4/30, 5/30, 6/11, 7/9, 7/23

^b Mean of 4 replications.

^c Means followed by the same letter are not significantly different (LSD, p=0.05).

Table 7. Summer Patch Quality Rating, 2007.
Location: Dearborn Country Club, Dearborn, MI.
Rating Scale: 1-10, where 1=poor, 7=acceptable, and 10=excellent.

Trt #	Treatment and Rate/1000 sq ft	Application Interval (Days) ^a	Jul 23		Aug 1		Aug 15		Aug 30	
			Mean ^b	LSD ^c	Mean	LSD	Mean	LSD	Mean	LSD
25	CLEXP-9 1.2 oz	75 + 21	8.0	a	8.0	a	8.8	a	7.8	a
40	Proprietary									
11	Lynx Fungicide 0.75 fl oz	65 + 30 + 30	7.0	a-d	7.3	a-d	7.0	bc	5.5	bc
12	Lynx Fungicide 1.5 fl oz	65 + 30 + 30	7.0	a-d	7.0	b-e	6.5	b-e	5.5	bc
17	Lynx Fungicide 1.5 fl oz	75 + 30	7.0	a-d	7.0	b-e	7.0	bc	5.3	b-d
27	Endorse 4 oz	75 + 14	7.3	a-c	7.0	b-e	7.0	bc	5.3	b-d
30	Headway 3 fl oz	65 + 21 + 21	7.0	a-d	7.3	a-d	7.0	bc	5.3	b-d
13	Tartan II 2 fl oz	65 + 30 + 30	7.0	a-d	7.0	b-e	6.8	b-d	5.0	b-e
18	Tartan II 2 fl oz	75 + 30	7.0	a-d	7.0	b-e	6.3	b-f	5.0	b-e
9	Tartan 2 fl oz	65 + 30 + 30	6.8	b-e	6.8	c-f	6.0	c-g	4.8	c-f
10	Bayleton 1.5 fl oz	65 + 30 + 30	7.0	a-d	7.0	b-e	5.5	d-i	4.5	c-g
31	Headway 3 fl oz	75 + 21 + 21	8.0	a	7.8	ab	7.0	bc	4.5	c-g
41	Proprietary									
45	Proprietary									
48	Proprietary									
5	Proprietary									
7	Proprietary									
26	Endorse 4 oz	75 + 21	6.8	b-e	7.3	a-d	6.3	b-f	4.3	c-g
28	Instrata 6 fl oz	65 + 21 + 21	7.3	a-c	7.0	b-e	6.0	c-g	4.3	c-g
29	Instrata 6 fl oz	75 + 21 + 21	7.5	ab	7.3	a-d	5.8	c-h	4.3	c-g
36	Proprietary									
46	Proprietary									
2	Insignia 0.5 oz + Trinity 1.5 fl oz	75 + 30	7.0	a-d	6.8	c-f	6.5	b-e	4.0	c-g
3	Trinity 2.0 fl oz	75 + 30	7.5	ab	7.3	a-d	5.5	d-i	4.0	c-g
20	Compass WG 0.11 oz	65 + 30 + 30 + 30	6.5	b-e	6.5	d-g	4.5	h-k	4.0	c-g
21	Compass WG 0.25 oz	65 + 30 + 30 + 30	6.3	c-e	6.3	e-g	5.3	e-j	4.0	c-g

38	Proprietary									
1	Insignia 0.9 oz	75 + 30	6.0	de	6.3	e-g	4.8	g-k	3.8	d-g
6	Proprietary									
14	Tartan 2 fl oz	75 + 30	6.5	b-e	6.0	fg	4.3	i-k	3.8	d-g
15	Bayleton 1.5 fl oz	75 + 30	7.0	a-d	6.5	d-g	5.3	e-i	3.8	d-g
19	Headway 2 fl oz	75 + 30	6.5	b-e	6.8	c-f	5.5	d-i	3.8	d-g
32	DeFenseman 0.35 lbs + Floradox Pro 1.5 fl oz	65 + 30 + 14	6.5	b-e	6.5	d-g	5.0	f-j	3.8	d-g
34	Control	---	6.5	b-e	6.3	e-g	4.5	h-k	3.8	d-g
44	Proprietary									
49	Proprietary									
4	Proprietary									
8	Proprietary									
16	Lynx Fungicide 0.75 fl oz	75 + 30	7.0	a-d	7.0	b-e	6.0	c-g	3.5	e-g
23	3336 PLUS 6 fl oz	75 + 21	5.8	e	6.8	c-f	5.3	e-j	3.5	e-g
24	3336F 8 fl oz	75 + 21	6.8	b-e	6.5	d-g	5.0	f-j	3.5	e-g
33	Banner Maxx 4 fl oz	75 + 28	7.5	ab	7.0	b-g	5.5	d-i	3.5	e-g
35	Proprietary									
39	Proprietary									
42	Proprietary									
43	Proprietary									
37	Proprietary									
22	Compass WG 0.39 oz	65 + 30 + 30 + 30	6.0	de	6.3	e-g	4.0	jk	3.0	g
47	Proprietary									

^a Application intervals listed were applied on the following dates:

Application Interval Listed	Application Dates
75 + 30	5/21, 6/22
65 + 30 + 30	4/30, 5/30, 6/25
65 + 30 + 30 + 30	4/30, 5/30, 6/25, 7/23
75 + 21	5/21, 6/11, 7/2, 7/23
65 + 21 + 21	4/30, 5/21, 6/11
75 + 14	5/21, 6/6, 6/22, 7/2, 7/16, 8/1
75 + 21 + 21	5/21, 6/11, 7/2
65 + 30 + 14	4/30, 5/30, 6/11, 7/9, 7/23

^b Mean of 4 replications.

^c Means followed by the same letter are not significantly different (LSD, $p=0.05$).

Summer Stress Syndrome in Bentgrass, 2007

This trial was conducted on a Penncross creeping bentgrass green at the Hancock Turfgrass Research Center, E. Lansing, MI. The plot area was initially mowed at 0.170" using a triplex mower and gradually reduced to 0.130" using a walk-behind mower. Fertility was maintained at approximately 1/4 lb. N/1000 ft²/ month with Country Club 18-3-12 fertilizer. All plots received the Country Club fertilizer except for the Floratine and NutriPak plots since they already contained fertility. The study was set up in a randomized complete block design with four replications of each treatment. Plots measured 2' x 4.5' 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 May 29, unless specified otherwise in Tables 8 and 9. All treatments were reapplied on 6/12, 6/26, 7/10, 7/24, and 8/6 unless indicated in Tables 8 and 9 below. The entire study area was treated with Emerald (0.13 oz and 0.18 oz/1000 sq ft) for the control of dollar spot on 7/24 and 8/5, respectively. Cascade Plus 16G (7 lbs/1000 sq ft) was applied on 6/22 for localized dry spot which had developed in the study. 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. Towards the end of the study period, a natural brown patch outbreak occurred in the study site. Two brown patch ratings were taken, one on Aug 13 when the treatments were still in effect, and one on Aug 29, 23 days after the last treatment applications were made and nine days after all treatments had expired (Table 9). 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, less than optimal irrigation level, and summer heat. The untreated control plots averaged less than acceptable turfgrass quality during the entire study, never reaching the acceptable quality rating of 7. Several treatments provided very good turfgrass quality, and were at or above the acceptable threshold. These treatments were: Signature/Daconil Ultrex, the Bayer program (Signature in combination with Chipco 26GT, Compass, Lynx Fungicide, and Tartan), and the Floratine program (see Table 8.) Signature/Chipco 26GT also provided acceptable turfgrass quality, as expected.

Insignia/Trinity, Trinity alone, and the Bayer program were the only three treatments in the study that exhibited no brown patch (Table 8.) The Signature/Chipco 26GT treatment provided good brown patch control at a level that was statistically similar to the three previous treatments and better than the untreated control. The Signature/Daconil Ultrex tank mix and the Floratine program also provided excellent brown patch control while they were current (Aug 13 rating date), but once these treatments had expired, the brown patch level increased to an unacceptable level (Aug 29 rating.) This is not surprising since both of these treatments contained chlorothalonil.

Table 8. Mean Quality Ratings of Summer Stress in Creeping Bentgrass, 2007.
Location: Hancock Turf Research Center, E. Lansing, MI.
Rating Scale: 1-10 scale, where 1 = poor, 7 = acceptable, and 10 = excellent.

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted below)	Interval (Days)	Jun 20		Jul 2		Jul 18		Jul 23		Aug 2		Aug 13	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
5	Signature 4 oz + Daconil Ultrex 3.2 oz	14	7.3	ab	7.8	a	8.0	a	8.0	a	8.0	a	8.0	a
11	Proprietary													
4A	Signature 4 oz + Chipco 26GT 4 fl oz	29-May	7.3	ab	7.8	a	8.0	a	8.0	a	8.0	a	7.0	c-e
4B	Signature 4 oz + Compass WP 0.25 oz	12-Jun												
4C	Signature 4 oz + Lynx Fungicide 1.5 fl oz	26-Jun												
4D	Signature 4 oz + Tartan 2 fl oz	10-Jul												
4E	Signature 4 oz + Chipco 26GT 4 fl oz	24-Jul												
4F	Signature 4 oz + Compass WP 0.25 oz	6-Aug												
10	Proprietary													
9	Proprietary													
18	Signature 4 oz + Chipco 26GT 4 fl oz	14	6.8	a-d	7.0	a-d	7.5	a	7.3	b-d	7.5	a-c	7.0	c-e
3	Astron 2.5 fl oz + Carbon N 5 fl oz + Carbon PK Fight 4 fl oz + Echo Ultimate 3.25 oz + Knife 1.5 fl oz + P-48 0.15 lbs + ProteSyn 3 fl oz	14	7.3	ab	7.3	a-c	7.5	a	7.0	c-e	7.8	ab	7.3	b-d
6	Proprietary													
13	Proprietary													
12	Proprietary													

7	Proprietary													
15	Proprietary													
2	Trinity 1.0 oz	14	6.0	de	6.3	de	6.0	cd	6.5	ef	6.8	d-f	6.0	g
14	Proprietary													
8	Proprietary													
1	Insignia 0.5 oz + Trinity 1.0 oz	14	6.5	b-e	6.8	b-e	6.8	b	6.3	f	7.0	c-e	6.0	g
19	Control	---	6.5	b-e	6.5	c-e	5.8	de	5.5	g	6.5	e-g	6.3	fg
16	NutriPak 8 fl oz/Acre	14 ^c	6.3	c-e	6.0	c	5.3	e	5.5	g	6.0	g	5.3	h

^a Mean of 4 replications;

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

^c Treatment initiated on 5/18/07.

Table 9. Brown Patch Rating on Summer Stress Study, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

Rating: Percent plot area with brown patch on bentgrass stress study.

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted below)	Interval (Days)	Aug 13		Aug 29	
			Mean ^a	LSD ^b	Mean	LSD
1	Insignia 0.5 oz + Trinity 1.0 oz	14	0.0	a	0.0	a
2	Trinity 1.0 oz	14	0.0	a	0.0	a
4A	Signature 4 oz + Chipco 26GT 4 fl oz	29-May	0.0	a	0.0	a
4B	Signature 4 oz + Compass WP 0.25 oz	12-Jun				
4C	Signature 4 oz + Lynx Fungicide 1.5 fl oz	26-Jun				
4D	Signature 4 oz + Tartan 2 fl oz	10-Jul				
4E	Signature 4 oz + Chipco 26GT 4 fl oz	24-Jul				
4F	Signature 4 oz + Compass WP 0.25 oz	6-Aug				
13	Proprietary					
14	Proprietary					
15	Proprietary					
12	Proprietary					
8	Proprietary					
11	Proprietary					

9	Proprietary					
10	Proprietary					
18	Signature 4 oz + Chipco 26GT 4 fl oz	14	0.13	a	4.0	a
7	Proprietary					
6	Proprietary					
5	Signature 4 oz + Daconil Ultrex 3.2 oz	14	0.0	a	12.0	ab
19	Control	---	12.8	b	25.5	bc
3	Astron 2.5 fl oz + Carbon N 5 fl oz + Carbon PK Fight 4 fl oz + Echo Ultimate 3.25 oz + Knife 1.5 fl oz + P-48 0.15 lbs + ProteSyn 3 fl oz	14	0.0	a	28.0	c
16	NutriPak 8 fl oz/Acre ^c	14	27.5	c	43.0	c

^a Mean of 4 replications.

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

^c Treatment initiated on 5/18/07.

Summer Stress Syndrome in Annual Bluegrass, 2007

This trial was conducted on a *Poa annua* green at the Hancock Turfgrass Research Center, E. Lansing, MI. The plot area was converted from a fairway mowed at 0.5" to a green mowed at 0.150" in the fall of 2006. This transition proved to be very stressful on the turf as the overall quality was very low during our study when we mowed the area even lower (as low as 0.125") and ended up raising the height back to 0.150" towards the end of the trial period. Fertility was maintained at approximately 0.4 lb. N/1000 ft²/ month with Country Club (18-3-12) fertilizer. All plots received the Country Club fertilizer at 0.4 lb except for the Floratine and NutriPak plots which received ¼ lb N/1000 sq ft of Country Club fertilizer since those treatments already contained fertility. The study was set up in a randomized complete block design with four replications of each treatment. Plots measured 2' x 4.5' with 1' alleys. The entire study area was treated with Emerald (0.13 oz and 0.18 oz/1000 sq ft) for the control of dollar spot on 7/24 and 8/5, respectively. 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 May 29, unless otherwise indicated in Table 10. Re-application of the 7-day treatment was made on 6/6, 6/13, 6/20, 6/26, 7/3, 7/10, 7/17, 7/24, 7/31, 8/6, and 8/14. Subsequent applications of 14-day treatments were made on 6/13, 6/26, 7/10, 7/24, and 8/6, except as listed in Table 10. Quality ratings were visually estimated using a 1 to 10 scale, where 1 = poor, 7 = acceptable, and 10 = excellent. Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Since the site for this study was taken from fairway height (0.5") to greens height (0.150 ") with a triplex mower this spring, then walk-mowed even lower this summer to 0.125" at one point, and then raised to 0.150", the degree of stress exerted on the annual bluegrass in this trial was tremendous. The plot area was extremely thin, and at no rating date during the study did any of the treatments exhibit turf quality that would meet acceptable golf course standards. However, treatments such as Signature/Daconil Ultrex, Insignia/Trinity, Trinity alone, the Bayer program (Signature in various combinations with Chipco

26GT, Compass, Lynx Fungicide, and Tartan), and the Floratine program all provided significantly better turfgrass quality than the untreated control. The program treatments exhibited a greening effect during some of the ratings, and the Insignia/Trinity tank mix and Trinity alone provided an increase in density, particularly in August.

Table 10. Mean Quality Ratings for Summer Decline in Annual Bluegrass, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

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

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted)	Interval (Days)	Jun 11		Jun 20		Jul 2		Jul 18		Jul 23		Jul 31		Aug 14	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
5	Signature 4 oz + Daconil Ultrex 3.2 oz	14	6.0	a-c	6.0	ab	6.5	ab	5.8	a	5.3	a	5.8	a	4.8	b
1	Insignia 0.5 oz + Trinity 1.0 fl oz	14	5.8	bc	5.5	b	5.3	d-f	4.8	b-d	4.0	b-d	5.5	a	6.3	a
2	Trinity 1.0 fl oz	14	5.5	c	5.5	b	5.5	c-f	5.3	a-c	4.5	a-c	5.5	a	6.0	a
4A	Signature 4 oz + Chipco 26GT 4 fl oz	29-May	5.8	bc	5.8	b	5.8	b-e	5.5	ab	4.5	a-c	5.5	a	4.8	b
4B	Signature 4 oz + Compass WP 0.25 oz	13-Jun														
4C	Signature 4 oz + Lynx SC 1.5 fl oz	26-Jun														
4D	Signature 4 oz + Tartan 2 fl oz	10-Jul														
4E	Signature 4 oz + Chipco 26GT 4 fl oz	24-Jul														
4F	Signature 4 oz + Compass WP 0.25 oz	6-Aug														
3	Astron 1.5 fl oz + Carbon N 4 fl oz + Carbon PK Fight 2 fl oz + Echo Ultimate 1.5 oz + Knife 1 fl oz + P-48 0.125 lbs + ProteSyn 2 fl oz	7	6.5	ab	6.0	ab	6.3	a-c	5.3	a-c	4.8	ab	5.3	ab	4.5	bc
13	Proprietary															
11	Proprietary															
10	Proprietary															
15	Proprietary															

14	Proprietary															
18	Signature 4 oz + Chipco 26GT 4 fl oz	14	6.0	a-c	5.8	b	5.3	d-f	4.0	d-f	4.0	b-d	4.0	de	3.3	d-f
7	Proprietary															
9	Proprietary															
8	Proprietary															
6	Proprietary															
12	Proprietary															
19	Control		5.8	bc	5.5	b	5.5	c-f	3.8	ef	3.0	e	3.8	e	2.8	f
16	NutriPak 8 fl oz/Acre ^c	14	5.8	bc	5.3	b	4.8	f	3.5	f	3.3	de	3.5	e	2.5	f

^a Mean of 4 replications.

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

^c Treatment initiated on 5/18/07.

Take All Patch, 2007

A curative take all patch (*Gaeumannomyces graminis*) study was established on a bentgrass fairway at the Hemlock Golf Club in Ludington, MI. The study was set up in a randomized complete block design with 4 replicates of each treatment. The plots were 6' x 9'. Treatments were applied using a CO₂-powered back pack sprayer at 38 psi using a single nozzle boom with 8002E Tee Jet flat fan nozzles. Treatments were applied in a spray volume of 96 GPA. Fertility was maintained by the superintendent at a rate of approximately ½ lb actual nitrogen/1000 sq ft per month for June-August, with supplemental fertility of ¼ lb actual nitrogen, using Country Club 18-3-12 fertilizer, applied on 7/25 and 8/8 to all treatments except the fertilizer treatment. Treatments were applied beginning on May 30, with subsequent applications of the 14 day treatments made on 6/13, 6/28, 7/13, 7/25, 8/8, and 8/28. Treatments on a 28-day schedule were reapplied on 6/28, 7/25, and 8/28. Plots were rated for visual estimation of percent area infected with take all patch (Tables 11-12) and turfgrass quality (Table 13). The quality ratings were taken on a 1-10 scale, where 1 is poor, 7 is acceptable, and 10 is excellent.

The take all patch site that was used for this study had initial (pretreatment) average disease ratings that ranged from 29-58% plot area infected, with the untreated control averaging 41%. None of the fungicide treatments in this trial produced a take all patch reduction that was statistically different from the untreated control. Therefore, although this study was conducted curatively, the data presented are the average percent plot area infected, on various rating dates ranging from May 30 (pretreatment) until the final disease rating on Sep 14. During the months of June and July, despite multiple fungicide applications, there were no significant differences between the amount of take all patch in the untreated control plots and any of the fungicide/fertilizer treated plots (Table 11.) By the Aug 8 rating, the only treatment that had a statistically significant difference in take all patch from the untreated control was the fertilizer (18-3-12) treatment applied at ½ lb actual nitrogen/1000

ft²/month. By the last two ratings (Sep 6 and 14), the treatments that provided the best take all patch control, compared to the untreated control, were the fertilizer (18-3-12), Heritage TL, Tourney, and V-10190 treatments. Heritage and the fertilizer treatment were also among the top treatments in terms of turfgrass quality. The Bayleton-treated plots exhibited slight yellowing by the Sep 6 and 14 ratings. No other treatments showed phytotoxicity during the disease trial.

In summary, the lack of fungicide efficacy during the June-July period may have been due to inadequate levels of fertility in the study area, although this same level of superintendent-applied fertility produced quality turf on the other golf course fairways.

Table 11. Take All Patch, 2007.

Location: Hemlock Golf Club, Ludington, MI.

Rating Scale: Mean percent plot area infected with take all patch.

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted)	Interval (Days)	May 30 (Pretreatment)		June 14		July 13		July 25	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD
12	Heritage TL 2 fl oz	28	41.3	ab	46.3	a-c	50.0	ab	46.3	ab
20	Fertilizer (18-3-12) 1/2 lb N	28	57.5	a	50.0	ab	36.3	ab	32.5	bc
10	V-10190 0.66 lb ai/A	14	45.0	ab	45.0	a-c	47.5	ab	47.5	ab
28	Proprietary								22.5	c
7	Tourney 0.37 oz	14	37.5	b	45.0	a-c	52.5	a	50.0	ab
3	Proprietary									
27	Proprietary									
4	Proprietary									
9	V-10190 0.44 lb ai/A	14	45.0	ab	42.5	a-c	47.5	ab	43.8	ab
6	Tourney 0.18 oz	14	43.8	ab	42.5	a-c	46.3	ab	46.3	ab
16	Lynx Fungicide 1.5 fl oz	28	32.5	b	38.8	a-c	45.0	ab	47.5	ab
14	Tartan 2 fl oz	28	35.0	b	33.8	bc	53.8	a	51.3	ab
25	ARY0534002 0.60 oz	14	45.0	ab	42.5	a-c	51.3	a	50.0	ab
21	Defenseman 3 lb/acre	28	40.0	ab	50.0	ab	52.5	a	47.5	ab
5	Proprietary									

1	Proprietary									
24	Disarm 0.36 fl oz	14	28.8	b	38.8	a-c	36.3	ab	32.5	bc
11	Headway 1.3 MEC 3 fl oz	28	42.5	ab	41.3	a-c	45.0	ab	41.3	a-c
13	Rubigan 4 fl oz	28	35.0	b	40.0	a-c	38.8	ab	37.5	a-c
17	Tartan II 2 fl oz	28	35.0	b	36.3	a-c	42.5	ab	41.3	a-c
19	Compass WG 0.25 oz	28	37.5	b	40.0	a-c	40.0	ab	38.8	a-c
18	Compass WG 0.125 oz	28	42.5	ab	52.5	a	51.3	a	50.0	ab
22	Cleary 3336F 6 fl oz	14	36.3	b	41.3	a-c	48.8	ab	50.0	ab
2	Proprietary									
26	Proprietary									
23	Control	---	41.3	ab	43.8	a-c	50.0	ab	47.5	ab
15	Bayleton SC 1.5 fl oz	28	32.5	b	40.0	a-c	46.3	ab	45.0	ab
8	V-10190 0.22 lb ai/A	14	38.8	b	42.5	a-c	46.3	ab	45.0	ab

^a Mean of 4 replications.

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

Table 12. Take All Patch, 2007, continued.

Location: Hemlock Golf Club, Ludington, MI.

Rating Scale: Mean percent plot area infected with take all patch.

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted)	Interval (Days)	Aug 8		Aug 28		Sep 6		Sep 14	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD
12	Heritage TL 2 fl oz	28	23.0	a-c	5.3	b	2.3	c	0.0	f
20	Fertilizer (18-3-12) 1/2 lb N	28	10.5	c	4.3	b	1.3	c	0.0	f
10	V-10190 0.66 lb ai/A	14	27.5	a-c	5.0	b	1.5	c	0.5	f
28	Proprietary								1.3	ef
7	Tourney 0.37 oz	14	28.8	a-c	6.5	b	8.5	a-c	1.5	ef
3	Proprietary									
27	Proprietary									
4	Proprietary									

9	V-10190 0.44 lb ai/A	14	26.3	a-c	5.8	b	5.0	bc	2.8	d-f
6	Tourney 0.18 oz	14	23.8	a-c	3.3	b	8.0	a-c	3.0	c-f
16	Lynx Fungicide 1.5 fl oz	28	32.5	a-c	9.3	ab	10.5	a-c	3.0	c-f
14	Tartan 2 fl oz	28	22.0	a-c	1.8	b	3.0	c	3.5	c-f
25	ARY0534002 0.60 oz	14	30.0	a-c	7.0	ab	5.5	bc	3.8	c-f
21	Defenseman 3 lb/acre	28	32.0	a-c	10.5	ab	7.0	a-c	5.3	b-f
5	Proprietary									
1	Proprietary									
24	Disarm 0.36 fl oz	14	32.5	a-c	15.0	ab	13.8	a-c	7.5	a-f
11	Headway 1.3 MEC 3 fl oz	28	35.0	ab	13.8	ab	13.0	a-c	8.0	a-f
13	Rubigan 4 fl oz	28	22.0	a-c	8.8	ab	8.3	a-c	8.0	a-f
17	Tartan II 2 fl oz	28	31.8	a-c	8.8	ab	11.8	a-c	9.3	a-f
19	Compass WG 0.25 oz	28	23.8	a-c	8.3	ab	10.0	a-c	10.5	a-f
18	Compass WG 0.125 oz	28	36.3	ab	13.0	ab	11.5	a-c	11.3	a-f
22	Cleary 3336 6 oz	14	31.3	a-c	9.3	ab	8.0	a-c	11.3	a-f
2	Proprietary									
26	Proprietary									
23	Control	---	42.5	a	15.0	ab	20.0	a	16.0	a-c
15	Bayleton SC 1.5 fl oz	28	33.8	ab	15.3	ab	18.8	ab	17.5	ab
8	V-10190 0.22 lb ai/A	14	43.0	a	22.5	a	21.3	a	20.0	a

^a Mean of 4 replications.

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

Table 13. Take All Patch Quality Rating, 2007.

Location: Hemlock Golf Club, Ludington, MI.

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

Trt #	Treatment and Rate/1000 sq ft (unless otherwise noted)	Interval (Days)	Aug 8		Sep 6		Sep 14	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
9	V-10190 0.44 lb ai/A	14	5.3	a-d	7.0	ab	7.0	a
12	Heritage TL 2 fl oz	28	6.0	ab	7.0	ab	7.0	a

20	Fertilizer (18-3-12) 1/2 lb N	28	6.5	a	7.3	a	7.0	a
3	Proprietary							
10	V-10190 0.66 lb ai/A	14	5.3	a-d	7.0	ab	6.8	ab
13	Rubigan 4 fl oz	28	5.5	a-d	6.5	a-d	6.8	ab
28	Proprietary							
1	Proprietary							
4	Proprietary							
6	Tourney 0.18 oz	14	5.8	a-c	6.8	a-c	6.5	a-c
16	Lynx Fungicide 1.5 fl oz	28	5.3	a-d	6.8	a-c	6.5	a-c
17	Tartan II 2 fl oz	28	5.0	b-d	6.5	a-d	6.5	a-c
25	ARY0534002 0.60 oz	14	5.3	a-d	6.8	a-c	6.5	a-c
27	Proprietary							
5	Proprietary							
19	Compass WG 0.25 oz	28	5.8	a-c	6.0	b-e	6.3	a-d
2	Proprietary							
7	Tourney 0.37 oz	14	5.5	a-d	6.8	a-c	6.0	a-d
11	Headway 1.3 MEC 3 fl oz	28	5.0	b-d	6.3	a-e	6.0	a-d
14	Tartan 2 fl oz	28	5.8	a-c	6.5	a-d	6.0	a-d
18	Compass WG 0.125 oz	28	5.0	b-d	6.3	a-e	6.0	a-d
21	Defenseman 3 lb/acre	28	5.5	a-d	6.8	a-c	6.0	a-d
22	Cleary 3336 6 oz	14	5.3	a-d	6.5	a-d	6.0	a-d
24	Disarm 0.36 fl oz	14	5.0	b-d	6.3	a-e	5.8	b-d
23	Control	---	4.3	d	5.8	c-e	5.5	cd
8	V-10190 0.22 lb ai/A	14	4.5	cd	5.3	e	5.3	d
15	Bayleton SC 1.5 fl oz	28	5.0	b-d	6.0 ^c	b-e	5.3 ^c	d
26	Proprietary							

^a Mean of 4 replications.

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

^c Slight yellowing (phytotoxicity) observed in the treatment on Sept 6 and 14.

Brown Patch (*Rhizoctonia solani*) 2007

Preventive Brown Patch Study on a Penneagle Creeping Bentgrass Green.

A preventive study was set up on a Penneagle creeping bentgrass green using the same parameters as described in Study A above. Fertility was maintained at a rate of approximately ½ lb actual N/1000 sq ft/month. Initial treatment application was made on 6/15. Subsequent applications of the 7-day treatments were made on 6/22, 6/28, 7/5, 7/13, 7/19, 7/26, 8/2, and 8/10. The 14-day treatments were reapplied on 6/28, 7/13, 7/26, and 8/10. The 21-day treatments were reapplied on 7/5 and 7/26. The 28-day treatments were reapplied on 7/5 and 7/26. The entire study was treated with Emerald at 0.13 oz for the control of dollar spot on 6/11 and 8/5. The study was inoculated with *R. solani* growing on a sand/cornmeal topdressing mixture on 6/4, 6/12, 7/5, 7/12, and 7/24. Plots were rated for percent area infected with brown patch on August 17, 24, and 29 (Table 14). Note that data are presented for the August 29 rating date even though the 7-day treatments were expired by 19 days, the 14-day treatments by 5 days, and the 21-day treatments by 10 days. The 28-day treatments were still current and within the stated application interval. In addition, turfgrass quality ratings were taken using a 1-10 scale where 1 is poor, 7 is acceptable quality, and 10 is excellent (Table 15). All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Brown patch developed relatively late in the season in this study, peaking at the end of August with the control exhibiting 25% disease. For the first two ratings (Aug 17 and 24) all treatments provided statistically significant brown patch control compared to the untreated check plots (Table 14). Most treatments displayed no brown patch disease at the time of the Aug 17 and 24 ratings. Although all of the treatments except the 28-day treatments had expired by the Aug 29 rating, some retained efficacy as seen in Table 14. Not surprisingly, fungicides such as Insignia, Trinity, Disarm, Daconil Ultrex/Chipco 26GT tank mix, various chlorothalonil products, Heritage, and Prostar were among the top performing products, some of which had expired and others that were still current. Interestingly, control was afforded by propiconazole products that were tested in this trial (Spectator Ultra and Banner Maxx), which are not traditionally considered to have strong efficacy on brown patch. Many treatments in this trial provided acceptable turfgrass quality including several tank mix treatments, Trinity, Insignia, Chipco 26GT, Disarm, 26/26, 3336 Plus, Banner Maxx, and Heritage as listed in Table 15. No phytotoxicity was observed in this trial, although a darkening of the turf (not considered undesirable) was noted in plots treated with propiconazole products.

Table 14. Preventive Brown Patch Study, 2007.

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

Rating Scale: Mean percent plot area infected with brown patch.

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Aug 17		Aug 24		Aug 29 ^d	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
1	Insignia 0.5 oz	14	0.0	a	0.0	a	0.0	a

2	Insignia 0.9 oz	28	0.0	a	0.0	a	0.0	a
3	Trinity 1 fl oz	14	0.0	a	0.0	a	0.0	a
4	Disarm 480SC 0.18 fl oz	14	0.0	a	0.0	a	0.0	a
6	Disarm 480SC 0.36 fl oz	28	0.0	a	0.0	a	0.0	a
7	ARY 0534002 SC 0.44 fl oz	14	0.0	a	0.0	a	0.0	a
8	ARY 0534002 SC 0.88 fl oz	28	0.0	a	0.0	a	0.0	a
19	Daconil Ultrex 3.2 oz + Chipco 26GT 4 fl oz	14	0.0	a	0.0	a	0.0	a
20	Spectator Ultra 2 fl oz	21	0.0	a	0.0	a	0.0	a
21	Manicure Ultra 3.25 oz	14	0.0	a	0.0	a	0.0	a
22	Manicure 6FL 3.6 fl oz	14	0.0	a	0.0	a	0.0	a
23	Spectator Ultra 2 fl oz + Manicure Ultra 3.25 oz	14	0.0	a	0.0	a	0.0	a
24	Manicure Ultra 1.82 oz + Spectator Ultra 1 fl oz	7	0.0	a	0.0	a	0.0	a
25	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	0.0	a	0.0	a	0.0	a
26	Disarm 480SC 0.18 fl oz + Manicure Ultra 1.82 oz	14	0.0	a	0.0	a	0.0	a
28	Heritage 0.2 oz	14	0.0	a	0.0	a	0.0	a
31A	Rhapsody 5 fl oz ^e	14	0.0	a	0.0	a	0.0	a
31B	Heritage TL 1 fl oz ^e	14						
32	Heritage TL 2 fl oz	14	0.0	a	0.0	a	0.0	a
16	Daconil Ultrex 3.2 oz	14	0.0	a	0.0	a	0.1	a
13	26/36 4 fl oz	14	0.0	a	0.8	a	1.3	ab
14	3336 PLUS 6 fl oz	14	0.0	a	0.0	a	1.8	ab
18	Daconil Ultrex 1.6 oz + Chipco 26GT 2 fl oz	14	0.0	a	0.0	a	1.8	ab
11	Captan 80WDG 110 g	14	0.0	a	0.0	a	2.0	ab
30	Chipco 26GT 4 fl oz	14	0.0	a	0.0	a	2.3	ab
5	Disarm 480SC 0.18 fl oz	21	0.5	a	1.8	a	2.5	ab
15	3336 PLUS 4 fl oz + Spotrete 4 oz	14	0.0	a	0.3	a	2.5	ab
9	Captan 80 WDG 55 g	14	0.0	a	0.0	a	3.3	ab
29	Prostar 1.5 oz	14	0.0	a	0.0	a	3.3	ab
12	Captan 480SC 182 ml	14	0.0	a	0.0	a	3.4	ab
27	Banner Maxx 1 fl oz	14	0.0	a	0.0	a	4.0	a-c

37	ARY 0505001 3 lbs ^c	6/15	3.8	b	10.0	bc	10.0	b-d
33	Rhapsody 5 fl oz	14	0.4	a	10.8	cd	13.3	cd
36	Proprietary							
10	Captan 480SC 91 ml	14	0.0	a	3.8	ab	17.0	de
34	Control	---	5.3	b	17.1	d	25.0	e

^a Mean of 4 replicate plots.

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

^c Treatment was applied on 6/15 only.

^d Disease rating taken after all treatments had expired: 7-day treatments expired by 19 days, the 14-day treatments by 5 days, and the 21-day treatments by 10 days. The 28-day sprays were still current.

^e Treatment applied to same plots separately (in different tanks.)

Table 15. Preventive Brown Patch Quality Rating, 2007.

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

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

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Aug 17		Aug 24		Aug 29 ^d	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
25	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	7.5	a	7.0	ab	7.8	a
3	Trinity 1 fl oz	14	7.3	ab	7.3	a	7.8	a
8	ARY 0534002 SC 0.88 fl oz	28	7.3	ab	7.3	a	7.8	a
7	ARY 0534002 SC 0.44 fl oz	14	7.0	a-c	7.3	a	7.5	ab
19	Daconil Ultrex 3.2 oz + Chipco 26GT 4 fl oz	14	7.0	a-c	7.3	a	7.5	ab
26	Disarm 480SC 0.18 fl oz + Manicure Ultra 1.82 oz	14	7.5	a	7.3	a	7.3	a-c
30	Chipco 26GT 4 fl oz	14	7.3	ab	7.0	ab	7.3	a-c
1	Insignia 0.5 oz	14	7.0	a-c	7.0	ab	7.0	b-d
2	Insignia 0.9 oz	28	7.0	a-c	6.8	a-c	7.0	b-d
4	Disarm 480SC 0.18 fl oz	14	7.0	a-c	7.0	ab	7.0	b-d
6	Disarm 480SC 0.36 fl oz	28	7.0	a-c	7.0	ab	7.0	b-d
13	26/36 4 fl oz	14	7.0	a-c	7.0	ab	7.0	b-d
14	3336 PLUS 6 fl oz	14	7.3	ab	7.0	ab	7.0	b-d
15	3336 PLUS 4 fl oz + Spotrete 4 oz	14	7.0	a-c	7.0	ab	7.0	b-d

18	Daconil Ultrex 1.6 oz + Chipco 26GT 2 fl oz	14	7.3	ab	7.3	a	7.0	b-d
27	Banner Maxx 1 fl oz	14	7.5	a	7.0	ab	7.0	b-d
32	Heritage TL 2 fl oz	14	7.0	a-c	7.0	ab	7.0	b-d
22	Manicure 6FL 3.6 fl oz	14	7.0	a-c	7.0	ab	6.8	c-e
31A	Rhapsody 5 fl oz ^e	14	7.0	a-c	7.0	ab	6.8	c-e
31B	Heritage TL 1 fl oz ^e	14						
5	Disarm 480SC 0.18 fl oz	21	7.3	ab	7.0	ab	6.5	d-f
16	Daconil Ultrex 3.2 oz	14	7.0	a-c	7.0	ab	6.5	d-f
21	Manicure Ultra 3.25 oz	14	7.0	a-c	6.8	a-c	6.5	d-f
28	Heritage 0.2 oz	14	7.0	a-c	6.8	a-c	6.3	e-g
9	Captan 80 WDG 55 g	14	7.3	ab	6.3	c-e	6.0	f-h
12	Captan 480SC 182 ml	14	7.3	ab	6.5	b-d	6.0	f-h
20	Spectator Ultra 2 fl oz	21	7.0	a-c	6.0	de	6.0	f-h
23	Spectator Ultra 2 fl oz + Manicure Ultra 3.25 oz	14	7.3	ab	6.0	de	5.8	g-i
24	Manicure Ultra 1.82 oz + Spectator Ultra 1 fl oz	7	7.3	ab	6.3	c-e	5.8	g-i
10	Captan 480SC 91 ml	14	6.8	b-d	6.0	de	5.8	g-i
29	Prostar 1.5 oz	14	6.8	b-d	6.3	c-e	5.8	g-i
34	Control	---	6.5	cd	6.0	de	5.8	g-i
36	Proprietary							
33	Rhapsody 5 fl oz	14	6.8	b-d	5.8	e	5.5	hi
37	ARY 0505001 3 lbs ^c	6/15	6.3	d	6.0	de	5.5	hi
11	Captan 80WDG 110 g	14	7.0	a-c	5.8	e	5.3	i

^a Mean of 4 replicate plots.

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

^c Treatment was applied on 6/15 only.

^d Disease rating taken after all treatments had expired: 7-day treatments expired by 19 days, the 14-day treatments by 5 days, and the 21-day treatments by 10 days. The 28-day sprays are still current.

^e Treatment applied to same plots separately (in different tanks.)

Curative Brown Patch Study on an Annual Bluegrass Putting Green, Study C, 2007.

A natural outbreak of brown patch occurred on a research putting green at the HTRC, East Lansing, MI, so a curative brown patch study was conducted. The study was conducted on an annual bluegrass green that had been maintained under very low fertility and irrigation. All study parameters were set up as in the previous brown patch studies (Studies A and B.) Treatments were applied on Curative Study C beginning on 8/10 only. A pretreatment brown patch rating was taken on 8/9

(Table 16.) Further ratings were taken on Aug 13 and 23, after which disease pressure subsided. All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

In this curative study, a pretreatment rating that was taken on Aug 9 showed a range in the average brown patch level from 8-29% disease (Table 16). Four days later, on Aug 13, another rating was taken where there were no significant differences between the control and any fungicide treatment. However, by the Aug 23 rating, separation between the control and many fungicides, including 3336 Plus, Disarm, Insignia, Daconil Ultrex/Chipco 26GT, Heritage, Trinity, and several tank mixes as listed in Table 16, was observed. Although the control averaged 18% brown patch, the disease pressure waned and no further disease ratings were possible. No phytotoxicity was observed.

Table 16. Curative Brown Patch Study, 2007.

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

Rating Scale: Mean percent plot area infected with brown patch, with August 9 rating being a pretreatment brown patch rating.

Trt #	Treatment and Rate/1000 sq ft	Application Timing ^c	Aug 9 pretreatment		Aug 13		Aug 23	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
8	ARY 0534002 SC 0.88 fl oz	28	20.0	a-c	17.5	a-d	0.5	h
15	3336 PLUS 4 fl oz + Spotrete 4 oz	14	8.5	bc	8.0	d	2.3	gh
14	3336 PLUS 6 fl oz	14	10.3	a-c	14.5	b-d	3.3	f-h
31A	Rhapsody 5 fl oz ^e	14	29.3	a	16.3	a-d	3.8	e-h
31B	Heritage TL 1 fl oz ^e	14						
26	Disarm 480SC 0.18 fl oz + Manicure Ultra 1.82 oz	14	19.8	a-c	18.8	a-d	4.3	e-h
1	Insignia 0.5 oz	14	11.8	a-c	12.5	cd	4.4	e-h
4	Disarm 480SC 0.18 fl oz	14	13.8	a-c	12.3	cd	4.5	e-h
18	Daconil Ultrex 1.6 oz + Chipco 26GT 2 fl oz	14	22.5	a-c	22.5	a-d	4.8	e-h
6	Disarm 480SC 0.36 fl oz	28	18.0	a-c	18.0	a-d	5.0	e-g
32	Heritage TL 2 fl oz	14	26.3	a-c	12.5	cd	5.3	e-h
21	Manicure Ultra 3.25 oz	14	18.0	a-c	15.0	b-d	5.5	e-h
7	ARY 0534002 SC 0.44 fl oz	14	23.0	a-c	21.8	a-d	5.8	e-h
5	Disarm 480SC 0.18 fl oz	21	16.8	a-c	16.8	a-d	6.3	d-h
23	Spectator Ultra 2 fl oz + Manicure Ultra 3.25 oz	14	25.5	a-c	21.8	a-d	6.3	d-h
9	Captan 80 WDG 55 g	14	17.5	a-c	17.5	a-d	6.8	d-h
12	Captan 480SC 182 ml	14	7.5	c	16.3	a-d	6.8	d-h

30	Chipco 26GT 4 fl oz	14	20.0	a-c	16.8	a-d	6.8	d-h
3	Trinity 1 fl oz	14	27.3	a-c	24.3	a-c	7.5	d-h
25	Disarm 480SC 0.18 fl oz + Spectator Ultra 1 fl oz	14	28.0	ab	23.0	a-c	8.0	c-h
24	Manicure Ultra 1.82 oz + Spectator Ultra 1 fl oz	7 ^d	19.8	a-c	25.0	a-c	8.3	c-h
13	26/36 4 fl oz	14	29.3	a	27.5	ab	8.5	c-h
20	Spectator Ultra 2 fl oz	21	30.5	a	23.8	a-c	8.8	c-h
33	Rhapsody 5 fl oz	14	22.5	a-c	20.0	a-d	10.5	c-h
29	Prostar 1.5 oz	14	29.3	a	22.5	a-d	11.3	c-g
10	Captan 480SC 91 ml	14	18.0	a-c	16.8	a-d	11.8	c-g
2	Insignia 0.9 oz	28	21.0	a-c	21.8	a-d	12.0	c-f
16	Daconil Ultrex 3.2 oz	14	24.8	a-c	21.3	a-d	12.3	b-f
22	Manicure 6FL 3.6 fl oz	14	26.8	a-c	22.5	a-d	13.1	a-e
11	Captan 80WDG 110 g	14	13.5	a-c	21.8	a-d	13.3	a-e
37	ARY 0505001 3 lbs	8/10	14.8	a-c	18.8	a-d	15.5	a-d
34	Control	---	26.3	a-c	15.5	a-d	17.5	a-c
19	Daconil Ultrex 3.2 oz + Chipco 26GT 4 fl oz	14	28.5	ab	30.0	a	21.8	ab
36	Proprietary							

^a Mean of 4 replicate plots.

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

^c All treatments were applied only once, on 8/10/07.

^d Treatment expired by 6 days.

^e Treatment applied to same plots separately (in different tanks.)

Waitea Patch (*Waitea circinata*, *Rhizoctonia zeae*), 2007

A preventive Waitea patch/yellow patch study was conducted this season on an annual bluegrass golf course putting green at Forest Acres Golf Course in East Lansing, MI. The study was established in 4 replicate plots measuring 6' x 9' in a randomized complete block design. Treatments were applied using a CO₂ backpack sprayer with a double nozzle (8002E Tee Jet flat fan) boom operating at 38 PSI with a spray volume of 2 gallons/1000 sq ft. The green was treated with proxy/primo as per standard golf course practices. Initial treatment applications were made on 5/18/07 with all treatments being re-applied on 6/1 and treatments 3-6 being applied on 6/15, 6/28, and 8/8, with the exception of V10116, which was not reapplied after the 6/1 application. The study was fertilized and watered at rates sufficient to maintain adequate turfgrass quality and vigor. The plots were rated for percent area with Waitea patch (Table 17.) Turfgrass quality was rated on a 1-10 scale with 1 being poor, 7

being acceptable, and 10 representing excellent turfgrass quality (Table 18.) All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

The causal organism was presumed to be *Rhizoctonia zae* or *Waitea circinata*, based on diagnostic field symptoms and the time of year when disease was observed. In recent years, the Forest Akers site has exhibited characteristic symptoms of this disease at various times throughout the growing season. This observation, as well as the fact that standard fungicide controls for *R. cerealis*-incited yellow patch (chlorothalonil, iprodione, etc) have been ineffective in recent years, further suggests that *R. zae*, rather than *R. cerealis*, is the causal organism.

Waitea patch pressure peaked in the study on June 4 when the controls exhibited an average of 59% disease, as shown in Table 17. Throughout the entire study, all fungicides tested provided significant disease control compared to the untreated check plots, and there were no statistical differences between any of the fungicide treatments. V10116-treated plots at 0.44 oz exhibited moderate phytotoxicity or yellowing of the turf and the 0.37 oz rate exhibited mild phytotoxicity. The moderate phytotoxicity observed in the 0.44 oz treatment continued through June 21 (data not shown), but by June 28, the effect was described as a darkening of the turf, not detrimental to the overall turf quality. The 0.37 oz treatment also continued to demonstrate darkening of the turf on June 21 and 28 observations (data not shown). By June 28, all turfgrass quality in all treatments was considered acceptable (rating of 7, data not shown.)

Table 17. Preventive Waitea Patch Study, 2007.

Location: Forest Acres Golf Course, East Lansing, MI.

Rating Scale: Mean percent plot area infected with Waitea patch.

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	June 1		June 4		June 15	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
5	Heritage 0.4 oz	14	0.0	a	0.0	a	0.0	a
2	V10116 0.44 oz	14	2.5	a	0.3	a	0.0	a
6	Medallion 0.5 oz	14	0.0	a	0.6	a	0.3	a
4	Prostar 1.5 oz	14	2.5	a	1.0	a	0.3	a
1	V10116 0.37 oz	14	6.3	a	1.4	a	0.0	a
3	Insignia 0.9 oz	14	6.3	a	2.6	a	0.1	a
7	Control	---	26.3	b	58.8	b	2.0	b

^a Mean of 4 replicate plots.

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

Table 18. Preventive Waitea Patch Quality Rating, 2007.

Location: Forest Acres Golf Course, East Lansing, MI.

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

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	June 1		June 4		June 15	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
5	Heritage 0.4 oz	14	7.8	a	6.8	a	7.3	a
4	Prostar 1.5 oz	14	7.0	ab	6.8	a	7.0	a
6	Medallion 0.5 oz	14	7.3	ab	6.8	a	7.0	a
3	Insignia 0.9 oz	14	6.5	bc	6.8	a	7.3	a
1	V10116 0.37 oz	14	7.5	a	6.3	a	5.0	b
2	V10116 0.44 oz	14	7.5	a	6.3	a	4.5	b
7	Control	---	6.0	c	5.3	b	7.0	a

^a Mean of 4 replicate plots.

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

Algae Study, 2007

A study was conducted to determine whether differing amounts of algae developed in various fungicide-treated plots. The study was performed on a creeping bentgrass putting green at the Hancock Turfgrass Research Center on the campus of Michigan State University, East Lansing, MI. Four replicate 2' x 4.5' plots were set up in a randomized complete block design with 1' alleys between rows of plots. The study was fertilized at a rate of 0.25 lb actual nitrogen/1000 sq ft per month using Country Club (18-3-12) fertilizer. Irrigation was maintained at a rate sufficient to encourage algal growth. Treatments were applied using a CO₂-powered back pack sprayer with a single Tee Jet 8002E flat fan nozzle at a spray volume of 1 gallon/1000 sq ft. Initial treatment application was made on 5/31/07 with subsequent applications on 6/13, 6/28, 7/12, 7/26, and 8/8. Emerald was applied at a 0.13 oz rate on 6/11 for the control of dollar spot. Plots were rated for percent algal coverage once algae developed in the study area (Table 19). In addition, turfgrass quality ratings were taken using a 1-10 scale where 1 is poor, 7 represents acceptable quality, and 10 is excellent quality (Table 20). Brown patch disease developed in the study area, so a disease rating was taken (Table 21). All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Algae developed in this study site by mid-August, and it peaked by the Aug 23 rating with an average of 64% in the most severely affected, fungicide-treated plots (Table 19.) The Banner Maxx treated plots had an average of 29% algae on Aug 15, and that percentage increased to 64% by Aug 23. These were the highest average amounts of algae in the study, and they were significantly worse than all other treatments tested in this study on both rating dates. There was no statistical difference between the untreated control and any of the fungicide-treated plots, except for Banner Maxx, on Aug 15. On Aug 23, the

Signature/Daconil Ultrex tank mix treatment was the only treatment to provide statistically less algae than the control. However, there were differences observed between the various fungicides. Plots treated with Signature/Daconil Ultrex, Fore, or Trinity (several rates tested) were not statistically different in terms of the amount of algae in the plots, with the averages ranging from 1-19% algae. Lynx, at an average of 23%, provided algae control similar to Trinity, but not as good as Fore or the Signature/Daconil Ultrex tank mix. The Trinity- and Lynx-treated plots had significantly less algae than the other DMI fungicides tested, namely Bayleton, Eagle, and Banner Maxx.

Quality differences were observed throughout this trial. By July 19, plots treated with Banner Maxx, Bayleton, and Eagle all appeared darker in color than the rest of the plots, but the effect would not be considered detrimental or undesirable. By Aug 23, the Trinity-treated plots were among those with the best overall turf quality (Table 20.) Most of the plots had less than optimal turf density resulting in a slightly detrimental effect on overall turf quality. The untreated control and Banner Maxx plots had the worst overall turf quality.

In addition to algae and quality differences, a natural outbreak of brown patch occurred in the study site so a rating was taken on Aug 15, and treatment differences were observed. Lynx, Trinity, Eagle, Bayleton, and Banner Maxx all provided statistically similar brown patch control that was better than Fore or Signature/Daconil Ultrex. The untreated controls averaged 58% brown patch, which was significantly worse than all fungicide-treated plots.

Table 19. Algae Study, 2007.

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

Rating Scale: Mean percent plot area infested with algae.

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	Aug 15		Aug 23	
			Mean ^a	LSD ^b	Mean	LSD
10	Signature 4 oz + Daconil Ultrex 3.2 oz	14	0.0	a	0.8	a
9	Fore 6 oz	14	0.8	a	4.0	ab
2	Trinity 0.75 fl oz	14	4.0	a	8.5	a-c
3	Trinity 1.0 fl oz	14	4.4	a	11.3	a-c
1	Trinity 0.5 fl oz	14	4.4	a	15.0	a-c
4	Trinity 2.0 fl oz	14	4.5	a	18.8	a-c
11	Control	---	6.3	a	21.3	bc
8	Lynx SC 2.0 fl oz	14	4.3	a	22.8	c
6	Bayleton 1.0 oz	14	11.5	a	45.0	d
7	Eagle WSP 1.2 oz	14	8.0	a	45.0	d

5	Banner Maxx 2.0 fl oz	14	28.8	b	63.8	e
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^a Mean of 4 replicate plots.

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

Table 20. Algae Study Quality Rating, 2007.

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

Rating Date: August 23, 2007.

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

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean ^a	LSD
4	Trinity 2.0 fl oz	14	7	7	7	7	7.0	a
2	Trinity 0.75 fl oz	14	6	7	7	7	6.8	ab
1	Trinity 0.5 fl oz	14	6	na	7	7	6.7	a-c
3	Trinity 1.0 fl oz	14	6	6	7	7	6.5	a-c
8	Lynx SC 2.0 fl oz	14	6	7	6	7	6.5	a-c
9	Fore 6 oz	14	6	6	6	7	6.3	bc
10	Signature 4 oz + Daconil Ultrex 3.2 oz	14	7	6	6	6	6.3	bc
6	Bayleton 1.0 oz	14	6	6	6	6	6.0	c
7	Eagle WSP 1.2 oz	14	7	5	6	6	6.0	c
11	Control	---	5	5	5	6	5.3	d
5	Banner Maxx 2.0 fl oz	14	5	na	5	5	5.0	d

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

Table 21. Brown Patch Rating on Algae Study, 2007.

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

Rating Date: August 15, 2007.

Rating Scale: Percent plot area infected with brown patch.

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean	LSD ^a
4	Trinity 2.0 fl oz	14	5	0	0	0	1.3	a
8	Lynx SC 2.0 fl oz	14	5	0	0	0	1.3	a

3	Trinity 1.0 fl oz	14	7	0	0	0	1.8	a
7	Eagle WSP 1.2 oz	14	10	0	0	0	2.5	a
2	Trinity 0.75 fl oz	14	7	0	0	5	3.0	a
6	Bayleton 1.0 oz	14	7	0	5	3	3.8	a
5	Banner Maxx 2.0 fl oz	14	20	5	0	0	6.3	a
1	Trinity 0.5 fl oz	14	7	0	3	20	7.5	a
9	Fore 6 oz	14	25	5	30	35	23.8	b
10	Signature 4 oz + Daconil Ultrex 3.2 oz	14	10	50	15	40	28.8	b
11	Control	---	60	60	60	50	57.5	c

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

Pythium Blight (*Pythium aphanidermatum*), 2007

This study was conducted on an irrigated annual bluegrass golf course fairway at West Shore Golf Club located in Grosse Ile, MI. The plots measured 6' x 9' and were replicated four times in a randomized complete block design. Treatments were applied using a CO₂-powered backpack sprayer with a double-nozzle boom containing two Tee Jet flat fan 8002E nozzles. Treatments were applied at a pressure of 38 psi and an application volume of 96 GPA. Irrigation and fertility were maintained by golf course personnel and held at an elevated level to encourage succulent growth. All preventive treatment applications were initiated on June 18, 2007, or as listed in Tables 22 or 23. The 14-day interval treatments were reapplied on 7/2, 7/16, 7/30, and 8/13. The 21-day treatments were reapplied on 7/9 and 7/30. The curative treatments were applied on 8/13/07, after disease had developed in all of the plots. The plots were visually rated for percent plot area infected with Pythium blight, and the disease means are presented in Table 22. In addition, turfgrass quality was rated using a 1-10 scale (Table 23.) All data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Pythium blight pressure was light to moderate in our trial this year. The first Pythium blight rating was taken on Aug 6, when the control averaged only 0.8% disease (Table 22). Disease pressure peaked in the control by Aug 27 with an average of 7.5% disease. However, some of the fungicide-treated plots developed larger amounts of disease, some of which were statistically worse than the untreated controls. Disarm, Insignia, Heritage, and Autograph were among the top-performing products, but no significant differences were obtained between these fungicide-treated plots and the untreated controls. The curative treatments that were applied on Aug 13 did not provide much disease control due to the lateness of Pythium development and the resulting delay of the curative application. Disease pressure subsided shortly after the curative treatments were applied. No treatments provided differences in turf quality compared to the untreated controls, and no phytotoxicity was observed.

Table 22. Pythium Blight Study, 2007.

Location: West Shore Golf Club, Grosse Ile, MI.

Rating Scale: Mean percent plot area with Pythium Blight infection.

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	Aug 6		Aug 13		Aug 27	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
22	Disarm 480SC 0.36 fl oz	14	0.0	c	0.0	e	0.0	f
23	ARY 0534003SC 3.5 fl oz	14	0.3	c	0.0	e	0.0	f
21	Disarm 480SC 0.18 fl oz	14	0.1	c	0.1	e	0.5	ef
24	ARY 0534003 7.0 oz	21	1.9	c	2.8	c-e	0.5	ef
17	Heritage WG 0.2 oz	14	0.0	c	0.9	e	0.8	ef
16	Insignia 0.9 oz	14	0.0	c	0.3	e	1.0	ef
13	Autograph 9.14 oz	14	0.8	c	0.1	e	1.3	ef
18	Subdue Maxx 1 fl oz	14	1.9	c	0.3	e	2.5	d-f
15	Signature 8 oz	14	0.0	c	0.1	e	2.8	d-f
28	Proprietary							
10	Autograph 4 oz	14	1.3	c	6.8	b-e	4.5	b-f
5	Banol 2 fl oz (applied curatively)	14	0.0	c	1.3	e	5.0	b-f
14	Signature 4 oz	14	0.8	c	3.1	c-e	5.0	b-f
2	Stellar 2.0 fl oz (applied curatively)	14	2.4	c	6.3	b-e	5.5	b-f
11	Autograph 8 oz	14	5.8	bc	6.8	b-e	5.5	b-f
12	Autograph 4.57 oz	14	0.0	c	2.8	c-e	6.5	a-f
26	Control	---	0.8	c	3.3	c-e	7.5	a-f
6	Alude 5.5 fl oz	14	0.0	c	1.5	e	8.8	a-f
19	Banol 4 fl oz	8/13	na		na		10.0 ^d	a-f
29	Proprietary							
27	Proprietary							
4	Stellar 2.0 fl oz	8/13	na		na		12.5 ^d	a-f
8	CLEXP-1 8 fl oz	14	0.3	c	5.3	c-e	13.8	a-f
1	Stellar 1.2 fl oz	14	0.5	c	3.3	c-e	16.0	a-e
7	CLEXP-1 4 fl oz	14	1.8	c	10.9	b-e	18.0	a-d
3	Stellar 1.2 fl oz (applied curatively)	8/13	na		na		18.3 ^d	a-d

9	CLEXP-1 16 fl oz	14	1.1	c	2.5	de	18.8	a-c
20	Subdue Maxx 1 fl oz (applied curatively)	8/13	na		na		20.0 ^d	ab
25	ARY 0505001 3 lbs ^e	7/2	15.0	a	16.9	ab	21.5	a

^a Mean of 4 replicate plots.

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

^c Treatment applied curatively on 8/13 only, when disease levels averaged between 7 and 23 percent.

^d Rating after one curative application 14 days prior.

^e Treatment was applied on 7/2 only.

Table 23. Pythium Blight Study, 2007.

Location: West Shore Golf Club, Grosse Ile, MI.

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

Trt #	Treatment and Rate/1000 sq ft	Interval (Days)	Aug 6		Aug 13		Aug 27	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD
13	Autograph 9.14 oz	14	6.8	a-c	6.8	a-c	7.0	a
16	Insignia 0.9 oz	14	6.8	a-c	7.0	ab	7.0	a
17	Heritage WG 0.2 oz	14	7.3	a	6.8	a-c	7.0	a
22	Disarm 480SC 0.36 fl oz	14	7.3	a	7.0	ab	7.0	a
23	ARY 0534003SC 3.5 fl oz	14	6.8	a-c	7.5	a	7.0	a
18	Subdue Maxx 1 fl oz	14	6.8	a-c	6.8	a-c	6.8	ab
21	Disarm 480SC 0.18 fl oz	14	7.3	a	7.5	a	6.8	ab
24	ARY 0534003 7.0 oz	21	6.3	b-d	6.8	a-c	6.8	ab
5	Banol 2 fl oz	14	7.0	ab	6.8	a-c	6.5	a-c
10	Autograph 4 oz	14	7.0	ab	6.0	b-d	6.5	a-c
15	Signature 8 oz	14	7.0	ab	7.0	ab	6.5	a-c
11	Autograph 8 oz	14	6.8	a-c	6.0	b-d	6.3	a-d
12	Autograph 4.57 oz	14	6.5	a-c	6.3	a-d	6.3	a-d
14	Signature 4 oz	14	6.8	a-c	6.0	b-d	6.3	a-d
28	Proprietary							
2	Stellar 2.0 fl oz	14	6.8	a-c	5.8	b-e	6.0	a-d
6	Alude 5.5 fl oz	14	6.8	a-c	6.8	a-c	6.0	a-d

26	Control	---	7.0	ab	6.3	a-d	6.0	a-d
19	Banol 4 fl oz ^c	8/13	na		na		5.8 ^d	a-d
29	Proprietary							
4	Stellar 2.0 fl oz ^c	8/13	na		na		5.5 ^d	a-d
7	CLEXP-1 4 fl oz	14	6.5	a-c	5.5	c-e	5.5	a-d
27	Proprietary							
8	CLEXP-1 8 fl oz	14	6.8	a-c	5.8	b-d	5.3	b-d
1	Stellar 1.2 fl oz	14	6.8	a-c	5.8	b-e	5.0	cd
3	Stellar 1.2 fl oz ^c	8/13	na		na		5.0 ^d	cd
25	ARY 0505001 3 lbs ^e	7/2	5.5	d	4.3	e	5.0	cd
9	CLEXP-1 16 fl oz	14	6.5	a-c	6.3	a-d	4.8	d
20	Subdue Maxx 1 fl oz ^c	8/13	na		na		4.8 ^d	d

^a Mean of 4 replicate plots.

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

^c Treatment applied curatively on 8/13 only, when disease levels averaged between 7 and 23 percent.

^d Rating after one curative application 14 days prior.

^e Treatment was applied on 7/2 only.

Preventive Dollar Spot (*Sclerotinia homoeocarpa*, *Rutstroemia floccosum*) on an Annual Bluegrass Fairway

Two preventive dollar spot studies were conducted on an annual bluegrass fairway (0.5" height of cut). Each study was set up in a randomized complete block design and consisted of 4 replicate 2' x 4.5' plots with 1' alleys. Treatments were applied using a CO₂ backpack sprayer at 38 PSI and 1 gal/1000 sq ft application volume using a single 8002E Tee Jet flat fan nozzle. Plots were fertilized as needed at a rate of approximately 1/4 lb nitrogen/1000 sq ft/month.

Fairway Dollar Spot, Study A.

The treatments in Study A were applied beginning on 6/9/07, with subsequent applications of the 14-day interval treatments being made on 6/22 and 7/5. The 21-day treatments were reapplied on 6/28. Due to the lack of disease development within and around the study area, this study was abandoned and a second (Study B) was established in another location at the research center. However, by mid-August, dollar spot finally developed in the area, so a disease and quality rating were taken (Tables 26-27.) These ratings were taken even though treatments had been expired for four weeks. Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

Dollar spot developed in this study area in August. Although treatment application intervals had expired by four weeks, all of the fungicides tested provided significant dollar spot control compared to the untreated check (Table 26.) Turfgrass quality

ratings were taken, and all fungicide treatments provided significantly better turf quality than the untreated control. In addition, 26/36, CLEXP-9, Concert, Instrata, Headway, and Banner Maxx all provided significantly better turf quality than Chipco 26GT or Daconil Ultrex. No phytotoxicity was observed.

Table 26. Fairway Dollar Spot Study A, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

Rating Scale: Mean percent area blighted by dollar spot.

Rating Date: August 16, 2007.

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Mean ^a	LSD ^b
2	CLEXP-9 1.2 oz	21	0.7	b
4	Instrata 4 fl oz	21	2.0	b
3	Concert 5.4 fl oz	21	2.5	b
1	26/36 4 oz	21	3.0	b
5	Headway 1.5 fl oz	21	3.0	b
8	Banner Maxx 1 fl oz	21	5.6	b
7	Chipco 26GT 2 fl oz	14	6.8	b
6	Daconil Ultrex 3.2 oz	14	8.8	b
10	Control	---	38.8	a

^a Mean of 4 replicate plots.

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

Table 27. Fairway Dollar Spot Study A, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

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

Rating Date: August 16, 2007.

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Mean ^a	LSD ^b
1	26/36 4 oz	21	7.0	a
2	CLEXP-9 1.2 oz	21	7.0	a
3	Concert 5.4 fl oz	21	7.0	a
4	Instrata 4 fl oz	21	7.0	a
5	Headway 1.5 fl oz	21	7.0	a

8	Banner Maxx 1 fl oz	21	7.0	a
7	Chipco 26GT 2 fl oz	14	6.5	b
6	Daconil Ultrex 3.2 oz	14	6.3	b
10	Control	---	5.3	c

^a Mean of 4 replicate plots.

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

Fairway Dollar Spot, Study B.

The treatments in Study B were applied beginning on 7/19/07, with subsequent applications of the 14-day interval treatments being made on 8/2 and 8/17. The 21-day treatments were reapplied on 8/10. Disease and quality ratings were taken and are presented in Table 28 -29. Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

In the second fairway study, again, all fungicide treatments provided statistically significant dollar spot control compared to the untreated check. None of the fungicides were statistically different from each other. In terms of turfgrass quality, all treatments tested provided improved quality over the untreated control. Overall quality was below acceptable standards, partially because the study area was maintained with low level fertility. CLEXP-9 provided acceptable turf quality with an average rating of 7 or above (Table 29.) No phytotoxicity was observed.

Table 28. Fairway Dollar Spot Study B, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

Rating Scale: Mean percent area blighted by dollar spot.

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Jul 31		Aug 16	
			Mean ^a	LSD ^b	Mean	LSD
2	CLEXP-9 1.2 oz	21	0.8	a	0.0	a
4	Instrata 4 fl oz	21	0.8	a	0.3	a
1	26/36 4 oz	21	0.3	a	0.4	a
5	Headway 1.5 fl oz	21	1.0	a	0.6	a
6	Daconil Ultrex 3.2 oz	14	1.4	a	1.4	a
3	Concert 5.4 fl oz	21	0.5	a	2.6	a
7	Chipco 26GT 2 fl oz	14	3.5	a	3.2	a
8	Banner Maxx 1 fl oz	21	2.8	a	3.3	a
10	Control	---	31.3	b	30.0	b

^a Mean of 4 replicate plots.

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

Table 29. Fairway Dollar Spot Study B, 2007.

Location: Hancock Turf Research Center, E. Lansing, MI.

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

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Jul 31		Aug 16	
			Mean ^a	LSD ^b	Mean	LSD
2	CLEXP-9 1.2 oz	21	7.0	a	7.5	a
4	Instrata 4 fl oz	21	6.8	ab	6.8	ab
1	26/36 4 oz	21	6.5	a-c	6.5	bc
6	Daconil Ultrex 3.2 oz	14	6.8	ab	6.5	bc
3	Concert 5.4 fl oz	21	6.8	ab	6.3	bc
5	Headway 1.5 fl oz	21	6.5	a-c	6.3	bc
8	Banner Maxx 1 fl oz	21	6.3	bc	6.0	bc
7	Chipco 26GT 2 fl oz	14	6.0	c	5.8	c
10	Control	---	5.0	d	4.5	d

^a Mean of 4 replicate plots.

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

Dollar Spot (*Sclerotinia homoeocarpa*/*Rutstroemia floccosum*) on a Creeping Bentgrass Green, 2007

This study was set up on a creeping bentgrass/annual bluegrass putting green in four replications of a randomized complete block design. The plots measured 2' x 7.5' with 6" 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 1 gallon/1000 sq ft. Plots were irrigated as needed and fertility was maintained at approximately 1/4 lb N/1000 sq ft/month with Country Club (18-3-12) fertilizer. Applications dates were: 8/15 (1/4 lb), 8/30 (1/8 lb), 9/12 (1/8 lb). Fungicide treatments were applied initially on 8/1 and re-applied at the intervals indicated in Tables 28 and 29. The 14-day treatments were re-applied on 8/15, 8/31, and 9/13. The 21-day treatments were re-applied on 8/23 and 9/13. Data represent mean percent plot area infected with dollar spot (Table 30). 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 31.) Data were analyzed using ANOVA and means separated by LSD (p= 0.05).

There was heavy dollar spot pressure in this disease trial, with the control peaking with an average of 54% by Sep 13. The dollar spot strains present in this plot area are benzimidazoles-resistant. Emerald, Spectator Ultra/Manicure Ultra, Instrata, Trinity, Spectator Ultra alone, Concert, Banner Maxx, CLEXP-9, Headway, Tartan, Disarm/ARY0534001, and Chipco 26GT were among the top performing products tested in this study, many of which provided total dollar spot control for the entire study

duration (Table 30.) Although many other products tested provided disease control that was statistically better than the untreated check, the level of control achieved was not always considered acceptable by golf course standards. The three curative treatments tested (Tourney at 2 rates and Emerald) all provided very good dollar spot control within two weeks of their first application on 8/31, especially since the dollar spot average ranged from 34-45% prior to their application and was reduced to 2-7% within the first two weeks after treatment. By three weeks after treatment, dollar spot averaged 1-3% in those same plots. It is possible that complete dollar spot control would have been achieved in the curative treatment plots had initial disease levels not been so high and if the treatments could have been initiated earlier in the season or in association with higher fertility. The Spectator Ultra/Manicure Ultra tank mix and Banner Maxx treatments averaged a minimum quality rating of 7.8 during the study and were among the group of products that provided good to excellent turfgrass quality (Table 31.) Other treatments that exhibited exceptional turf quality included Instrata, Headway, Concert, Trinity, CLEXP-9, Spectator Ultra, and Tartan. No phytotoxicity was observed.

Table 30. Dollar Spot Rating on Creeping Bentgrass, 2007.
Location: Hancock Turfgrass Research Center, E. Lansing, MI.
Rating Scale: Mean % plot area blighted by dollar spot.

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Aug 23		Aug 31		Sep 7		Sep 13		Sep 21	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
3	Emerald 0.18 oz	21	0.1	op	0.1	t	0.1	vw	0.0	s	0.0	r
18	Proprietary											
19	Proprietary											
20	Proprietary											
21	Proprietary											
22	Proprietary											
24	Proprietary											
29	Proprietary											
30	Proprietary											
71	Spectator Ultra 2 fl oz + Manicure Ultra 3.25 oz	14	0.0	p	0.0	t	0.0	w	0.0	s	0.0	r
72	Instrata 4 fl oz	14	0.0	p	0.0	t	0.0	w	0.0	s	0.0	r
2	Emerald 0.13 oz	14	0.0	p	0.1	t	0.0	w	0.1	s	0.0	r
4	Trinity 1.0 fl oz	14	0.0	p	0.1	t	0.0	w	0.1	s	0.0	r
62	Proprietary											
67	Spectator Ultra 1 fl oz	14	0.0	p	0.5	t	0.0	w	0.1	s	0.0	r
68	Spectator Ultra 2 fl oz	21	0.0	p	0.0	t	0.0	w	0.1	s	0.0	r

73	Concert 3.2 fl oz	14	0.0	p	0.2	t	0.0	w	0.1	s	0.0	r
77	Banner Maxx 2 fl oz	14	0.0	p	0.1	t	0.0	w	0.1	s	0.0	r
50	CLEXP-9 0.6 oz WP	14	0.0	p	0.6	st	0.1	vw	0.1	s	0.1	r
65	Proprietary											
74	Headway 1.5 fl oz	14	0.0	p	0.1	t	0.0	w	0.1	s	0.1	r
79	Tartan SC 1 fl oz	14	0.0	p	1.5	q-t	0.0	w	0.1	s	0.0	r
55	Proprietary											
64	Proprietary											
9	ARY-0534001 SC 0.35 fl oz + Disarm 480SC 0.1 fl oz	14	0.0	p	8.3	m-t	0.0	w	0.3	s	0.1	r
11	ARY-0534001 SC 0.7 fl oz + Disarm 480SC 0.2 fl oz	21	0.8	op	0.1	t	0.1	vw	0.4	rs	0.1	r
28	Proprietary											
59	Proprietary											
56	Proprietary											
66	Proprietary											
76	Chipco 26GT 4 fl oz	14	0.0	p	6.5	n-t	0.0	w	0.6	rs	0.1	r
5	Trinity 1.0 fl oz	21	1.5	n-p	0.1	t	0.1	vw	0.6	rs	0.1	r
53	Proprietary											
80	Tourney 0.37 oz	CUR 14 ^c	na		na		na		1.8	q-s	1.3	qr
52	Proprietary											
81	Tourney 0.44 oz	CUR 14 ^c	na		na		na		2.6	p-s	2.6	p-r
54	Proprietary											
63	Proprietary											
61	Proprietary											
23	Emerald 0.13 oz	CUR 14 ^c	na		na		na		7.0	n-s	2.5	p-r
45	Proprietary											
57	Proprietary											
44	Proprietary											
47	Proprietary											
60	Proprietary											
48	Proprietary											
58	Proprietary											
10	ARY-0534001 SC 0.35 fl oz + Disarm 480SC 0.1 fl oz	21	16.3	f-j	2.3	p-t	4.6	t-w	15.5	l-o	10.5	m-r

49	26/36 3 oz	14	3.1	m-p	17.5	i-n	10.3	o-w	16.0	l-n	11.3	m-r
8	ARY-0534001 SC 0.18 fl oz + Disarm 480SC 0.05 fl oz	14	8.8	i-p	25.5	h-k	7.1	q-w	21.3	k-m	9.8	n-r
51	Proprietary											
46	Proprietary											
43	Proprietary											
70	Manicure 6FL 3.6 fl oz	14	0.0	p	22.5	h-l	6.0	r-w	26.3	i-l	16.3	j-o
13A	Disarm 480SC 0.18 fl oz ALT W/	14 ALT	5.3	l-p	28.8	e-i	18.0	j-q	27.5	h-k	20.5	i-n
13B	Lynx 45WP 0.26 oz	14										
78	Daconil Ultrex 3.2 oz	14	0.0	p	28.0	f-j	16.8	k-s	27.5	h-k	22.5	h-m
32	Proprietary											
12	Disarm 480SC 0.18 fl oz + Daconil Ultrex 1.8 oz	14	6.1	k-p	27.5	f-k	27.5	j-p	29.5	g-k	31.5	d-i
33	Proprietary											
42	Proprietary											
37	Proprietary											
40	Proprietary											
26	Proprietary											
38	Proprietary											
1	Insignia 0.9 oz	14	32.5	b-d	42.5	a-c	31.3	b-h	37.5	d-h	28.0	e-j
69	Manicure Ultra 3.25 oz	14	1.5	n-p	26.3	g-k	15.5	l-t	37.5	d-h	24.3	g-l
36	Proprietary											
41	Proprietary											
7	Disarm 480SC 0.36 fl oz	14	22.5	d-f	42.5	a-c	31.3	b-g	40.0	c-g	33.8	b-h
27	Proprietary											
34	Proprietary											
14	Daconil WeatherStik 2.0 fl oz	14	19.5	e-h	38.8	a-f	28.0	d-k	41.3	c-f	36.3	a-g
39	Proprietary											
15	Equus 720 SST 2.0 fl oz	14	13.8	f-l	38.8	a-f	26.3	e-l	42.5	b-f	40.0	a-e
16	Equus 82.5% WDG 1.8 oz	14	17.5	e-i	37.5	a-g	28.8	c-j	45.0	a-e	46.3	ab
17	Daconil Ultrex 82.5% WDG 1.8 oz	14	14.3	f-l	41.3	a-d	32.5	b-g	45.0	a-e	37.5	a-f
6	Disarm 480SC 0.18 fl oz	14	21.3	e-g	40.0	a-e	33.8	b-g	46.3	a-e	32.5	c-i
25	Proprietary											
31	Proprietary											

75	Proprietary											
35	Proprietary											
82	Control	---	43.8	a	47.5	a	50.0	a	53.8	a	43.8	a-d

^a Mean of 4 replicate plots.

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

^c Treatment applied curatively with the initial application on 8/31/07.

Table 31. Quality Rating on a Preventive Dollar Spot Study on Creeping Bentgrass, 2007.

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

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

Trt #	Treatment and Rate/1000 sq ft	Application Timing	Aug 24		Sep 1		Sep 9		Sep 15		Sept 21	
			Mean ^a	LSD ^b	Mean	LSD	Mean	LSD	Mean	LSD	Mean	LSD
65	Proprietary											
71	Spectator Ultra 2 fl oz + Manicure Ultra 3.25 oz	14	7.8	ab	8.0	ab	7.8	ab	8.0	a	8.8	a
72	Instrata 4 fl oz	14	7.5	a-c	8.0	ab	7.5	a-c	8.0	a	8.0	a-c
73	Concert 3.2 fl oz	14	7.3	a-d	7.8	a-c	7.3	a-d	8.0	a	7.8	a-d
74	Headway 1.5 fl oz	14	7.8	ab	7.3	a	8.0	a	8.0	a	8.3	ab
77	Banner Maxx 2 fl oz	14	7.8	ab	8.0	ab	7.8	ab	8.0	a	8.3	ab
4	Trinity 1.0 fl oz	14	7.0	b-e	7.0	b-d	7.0	a-e	7.8	ab	7.5	b-e
22	Proprietary											
50	CLEXP-9 0.6 oz WP	14	7.3	a-d	7.3	a-d	7.3	a-d	7.8	ab	7.8	a-d
67	Spectator Ultra 1 fl oz	14	7.3	a-d	7.0	b-d	7.3	a-d	7.8	ab	7.5	b-e
68	Spectator Ultra 2 fl oz	21	7.3	a-d	7.5	a-c	7.0	a-e	7.8	ab	7.8	a-d
79	Tartan SC 1 fl oz	14	7.8	ab	7.0	b-d	7.3	a-d	7.8	ab	7.8	a-d
19	Proprietary											
20	Proprietary											
21	Proprietary											
28	Proprietary											
30	Proprietary											
59	Proprietary											
62	Proprietary											
64	Proprietary											
66	Proprietary											

81	Tourney 0.44 oz	CUR 14 ^c	na		na		na		7.3	a-d	7.0	c-f
2	Emerald 0.13 oz	14	7.0	b-e	7.0	b-d	7.0	a-e	7.0	a-e	7.3	b-f
3	Emerald 0.18 oz	21	7.0	b-e	7.0	b-d	7.0	a-e	7.0	a-e	7.0	c-f
5	Trinity 1.0 fl oz	21	6.8	c-f	7.0	b-d	7.0	a-e	7.0	a-e	7.0	c-f
9	ARY-0534001 SC 0.35 fl oz + Disarm 480SC 0.1 fl oz	14	7.0	b-e	5.8	e-g	7.0	a-e	7.0	a-e	7.0	c-f
18	Proprietary											
24	Proprietary											
29	Proprietary											
52	Proprietary											
53	Proprietary											
55	Proprietary											
56	Proprietary											
63	Proprietary											
76	Chipco 26GT 4 fl oz	14	7.0	b-e	6.3	d-f	7.3	a-d	7.0	a-e	7.5	b-e
80	Tourney 0.37 oz	CUR 14 ^c	na		na		na		7.0	a-e	7.3	b-f
11	ARY-0534001 SC 0.7 fl oz + Disarm 480SC 0.2 fl oz	21	6.8	c-f	7.0	b-d	6.8	b-f	6.8	b-e	7.3	b-f
23	Emerald 0.13 oz	CUR 14 ^c	na		na		na		6.8	b-e	6.8	d-g
61	Proprietary											
45	Proprietary											
54	Proprietary											
57	Proprietary											
44	Proprietary											
47	Proprietary											
48	Proprietary											
60	Proprietary											
49	26/36 3 oz	14	6.5	d-g	4.5	h-k	6.0	e-i	5.5	f-i	6.8	d-g
58	Proprietary											
8	ARY-0534001 SC 0.18 fl oz + Disarm 480SC 0.05 fl oz	14	6.3	e-h	4.3	i-l	6.5	c-g	5.3	g-j	6.8	d-g
10	ARY-0534001 SC 0.35 fl oz + Disarm 480SC 0.1 fl oz	21	5.8	g-i	6.8	c-e	6.5	c-g	5.0	h-j	6.8	d-g
46	Proprietary											
51	Proprietary											
13A	Disarm 480SC 0.18 fl oz ALT W/	14 ALT	6.5	d-g	3.5	k-o	5.5	g-k	4.5	i-k	5.8	g-i

13B	Lynx 45WP 0.26 oz	14										
70	Manicure 6FL 3.6 fl oz	14	7.0	b-e	4.5	h-k	6.5	c-g	4.5	i-k	6.3	f-h
43	Proprietary											
12	Disarm 480SC 0.18 fl oz + Daconil Ultrex 1.8 oz	14	6.5	d-g	3.8	j-n	5.3	h-l	3.8	k-m	5.0	i-k
32	Proprietary											
69	Manicure Ultra 3.25 oz	14	7.0	b-e	4.3	i-l	6.3	d-h	3.8	k-m	5.5	h-j
78	Daconil Ultrex 3.2 oz	14	6.8	c-f	3.8	j-n	5.3	h-l	3.8	k-m	5.8	g-i
1	Insignia 0.9 oz	14	4.5	k-m	2.5	o-q	4.0	m-p	3.5	k-n	5.8	g-i
37	Proprietary											
38	Proprietary											
7	Disarm 480SC 0.36 fl oz	14	5.3	i-k	2.8	n-q	4.0	m-p	3.3	l-o	4.8	i-l
25	Proprietary											
36	Proprietary											
40	Proprietary											
42	Proprietary											
33	Proprietary											
34	Proprietary											
6	Disarm 480SC 0.18 fl oz	14	5.3	i-k	2.5	o-q	3.3	p-r	2.8	m-o	4.8	i-l
14	Daconil WeatherStik 2.0 fl oz	14	5.8	g-i	3.0	m-q	4.0	m-p	2.8	m-o	4.3	k-n
26	Proprietary											
27	Proprietary											
31	Proprietary											
41	Proprietary											
15	Equus 720 SST 2.0 fl oz	14	5.8	g-i	3.0	m-q	3.8	n-p	2.5	no	3.8	l-n
16	Equus 82.5% WDG 1.8 oz	14	5.8	f-i	2.8	n-q	3.5	o-q	2.5	no	3.3	n
17	Daconil Ultrex 82.5% WDG 1.8 oz	14	6.0	b-e	2.5	o-q	3.5	o-q	2.5	no	3.8	l-n
39	Proprietary											
35	Proprietary											
75	Proprietary											
82	Control	---	3.3	o	2.0	q	2.3	r	2.3	o	3.5	mn

^a Mean of 4 replicate plots.

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

^c Treatment applied curatively with the initial application on 8/31/07.