

2000-2001 TURFGRASS PATHOLOGY REPORT
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2000-2001 SNOW MOLD (*TYPHULA ISHIKARIENSIS* AND *T. INCARNATA*)

Studies A and B

Two corporation-sponsored snow mold fungicide field studies were conducted during the fall and winter of 2000-2001. Treatments were applied to Study A on the Treetops/Sylvan Resort in Gaylord, MI and Study B on the Boyne Highlands Resort in Harbor Springs, MI on the dates indicated in Tables 1-2, respectively. Treatments were applied preventively to four replicate 6' x 9' creeping bentgrass (*Agrostis palustris*)/annual bluegrass (*Poa annua*) fairway plots where the turf was maintained at approximately ½" height of cut. Liquid treatments were applied with a CO₂ backpack sprayer at a pressure of 36 psi and a volume of 100 GPA using a flat-fan, double-nozzle boom. Granular products were pre-weighed and hand-applied.

Studies A and B were rated on 9-April, 2001 immediately following snow-cover melt-off. The predominant snow mold species was *Typhula ishikariensis* at Treetops and *Typhula incarnata* at Boyne Highlands. *Microdochium patch* (*Microdochium nivale*) was observed at both locations and was the predominant snow mold on some plots as indicated in each table.

As can be seen in Tables 1 and 2, disease pressure was severe at Treetops and moderate at Boyne Highlands. Disease pressure was relatively heavy, likely due to the long winter and extended snow cover. Under the severe disease conditions at Treetops, many treatments, including some standards, failed to provide adequate disease control. Under the less severe disease conditions at Boyne Highlands, many treatments provided adequate disease control. Mild phytotoxicity was observed in a few treatments, as indicated in the data tables.

Table 1. Snow Mold Study A.

Treetops/Sylvan Resort, Gaylord, MI						
Rating Date: 9-Apr-2001						
Rating Scale: Percent plot area diseased with a combination of <i>Microdochium nivale</i>, <i>Typhula ishikariensis</i> and <i>T. incarnata</i> unless otherwise noted.						
Treatment and Rate	Appl date(s)	I	II	III	IV	Mean^b
Ch 26GT 4 fl oz + Dac Ultrex 5.5 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	0	0	0	3	0.8 a
Ch 26GT 4 fl oz + Prostar 3.75 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	2	2	1	0.3	1.3 a
Lynx (45 WP) 2.22 oz + Turfcide 400 12 fl oz	30-Oct	7	2	3	1	3.3 a
Ch 26GT 8 fl oz + Dac. Ultrex 4 oz + Turfcide 400 12 fl oz	30-Oct	0.3	7	7	3	4.3 a

Spectro (90WDG) 5 oz ----- Defend (4F) 12 fl oz	28-Sep 30-Oct	5	5	7	7	6.0 ab
Turfcide 400 9 fl oz + Dac. Ultrex 3.64 oz	30-Oct	5	10	3	10	7.0 ab
Fore Rainshield (80 WP) 8 oz + Turfcide 400 12 fl oz	30-Oct	5	12	10	2	7.3 ab
Spectro (90 WDG) 8 oz ----- Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz	28-Sep 30-Oct	12	5	5	10	8.0 a-c
Bayleton (50WP) 2 oz + Turfcide 400 12 fl oz	30-Oct	15	7	5	5	8.0 a-c
Spectro (90WDG) 5 oz + Nutri Grow 3 fl oz ----- Defend (4F) 12 fl oz	28-Sep 30-Oct	15	15	3	2	8.8 a-d
Turfcide 400 9 fl oz + Fore (80W) 8 oz	30-Oct	15	7	3	10	8.8 a-d
Ch 26GT 4 fl oz + Dac. Ultrex 4 oz + Turfcide 400 6 fl oz	30-Oct	5	15	5	12	9.3 a-d
Spectro (90 WDG) 5 oz ----- Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz	28-Sep 30-Oct	10	15	7	10	10.5 a-e
Spectro (90 WDG) 8 oz ----- Defend (4F) 12 fl oz	28-Sep 30-Oct	12	7	12	12	10.8 a-f
Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz + Nutri Grow 3 fl oz	30-Oct	7	20	10	7	11.0 a-f
Eagle (40 WSP) 0.6 oz + Turfcide 400 12 fl oz	30-Oct	7	7	20	12	11.5 a-g
Spectro (90 WDG) 8 oz + Nutri Grow 3 fl oz ----- Defend (4F) 12 fl oz	28-Sep 30-Oct	12	5	7	30	13.5 a-g
Turfcide 400 12 fl oz	30-Oct	20	15	10	10	13.8 a-g
Defend (4F) 12 fl oz	30-Oct	25	7	15	12	14.8 a-h
Spectro (90 WDG) 4 oz + Defend (4F) 8 fl oz	30-Oct	15	30	12	3	15.0 a-h
Medallion (50 WG) 0.5 oz + Banner Maxx 3 fl oz	30-Oct	12	12	20	20	16.0 a-i
Spectro (90 WDG) 4 oz + Defend (4F) 8 fl oz + Nutri Grow 3 fl oz	30-Oct	20	10	12	25	16.8 a-i
Dac Weather Stik 5.5 oz + Heritage 0.4 oz + Banner Maxx 2 fl oz	30-Oct	25 ^a	20	25	20	22.5 b-j
Anderson TeeTime 10-0-14 6.66 lbs	30-Oct	7	40	25	25	24.3 c-j
Scotts F + FII 2X	30-Oct	40	40	7	15	25.5 d-j
Ch 26GT 4 fl oz + Heritage 0.4 oz + Turfcide 400 6 fl oz	30-Oct	20	20	35	30	26.3 e-k
L-0405 6 lbs	30-Oct	30	40	7	30	26.8 e-k
Medallion (50 WG) 0.5 oz	30-Oct	15	25	35	35	27.5 f-l
Dac Weather Stik 5.5 oz + Heritage 0.4 oz	30-Oct	40 ^a	40	15	30	31.3 h-m
Heritage 0.4 oz + Banner Maxx 2 fl oz	30-Oct	40 ^a	20	35	30 ^a	31.3 h-m
Ch. 26GT 4 fl oz + Signature 4 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	10	35	50	35	32.5 i-m
Turfcide 400 9 fl oz + Teremec SP 4.5 oz	30-Oct	35	40	20	35 ^a	32.5 i-m
Lebanon LF2 8 lbs	30-Oct	30	35	40	35	35.0 j-m
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	35	25	30	60	37.5 j-m
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz + PCNB (75 WP) 4 oz	30-Oct	15 ^a	35	85	20	38.8 j-n
Medallion (50 WG) 0.5 oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	25	30	75	40	42.5 k-o
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz +	30-Oct	50	40	40	40	42.5 k-o

Dac. Weather Stik (6F) 3.6 fl oz						
Medallion (50 WG) 0.5 oz - Gowan (50 WG)	30-Oct	25	50	40	60	43.8 l-o
Ch. 26GT 4 fl oz + Signature 4 oz	28-Sep, 30-Oct	70	30	20	70	47.5 m-o
Ch 26GT 4 fl oz + Prostar 3.75 oz + Signature 4 oz	28-Sep, 30-Oct	80 ^a	70 ^a	30 ^a	40 ^a	55.0 n-p
Ch. 26GT 4 fl oz + Prostar (70WP) 3.75 oz	28-Sep, 30-Oct	75 ^a	85 ^a	15	60 ^a	58.8 o-q
Ch. 26GT 4 fl oz + Ch. Triton 1 fl oz	28-Sep, 30-Oct	85 ^a	75 ^a	70	30	65.0 p-r
L-0406 6 lbs	30-Oct	95	65	80	60 ^a	75.0 q-s
Teremec SP 9 oz	30-Oct	90	70	75	70	76.3 rs
Dac Weather Stik 5.5 oz	30-Oct	75 ^a	95	75	80	81.3 r-t
Banner Maxx 4 fl oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	90 ^a	85 ^a	85	70	82.5 st
Manhandle 10 oz	30-Oct	85 ^a	90	80	75 ^a	82.5 st
Prostar 3.75 oz + Ch. Triton 1 fl oz	28-Sep, 30-Oct	98	90	80	95 ^a	90.8 st
Control		98	98	85	95	94.0 t

^aDisease present is Microdochium patch only.

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

Table 2. Snow Mold Study B.

Boyne Highlands Resort, Heather G.C., Harbor Springs, MI						
Rating Date: 9-Apr-2001						
Rating Scale: Percent plot area diseased with a combination of <i>Microdochium nivale</i>, <i>Typhula ishikariensis</i> and <i>T. incarnata</i> unless otherwise noted.						
Treatment and Rate	Appl date(s)	I	II	III	IV	Mean^c
Fore Rainshield (80 WP) 8 oz + Turfcide 400 12 fl oz	30-Oct	0	0	0	0	0.0 a
Turfcide 400 9 fl oz + Dac. Ultrex 3.64 oz	30-Oct	0	0	0	0	0.0 a
Ch 26GT 4 fl oz + Dac. Ultrex 4 oz + Turfcide 400 6 fl oz	30-Oct	0	0	0	0	0.0 a
Lynx (45 WP) 2.22 oz + Turfcide 400 12 fl oz	30-Oct	0.3	0	0	0	0.1 a
Spectro (90 WDG) 4 oz + Defend (4F) 8 fl oz + Nutri Grow 3 fl oz	30-Oct	0.3	0	0.3	0.3	0.2 a
Spectro (90 WDG) 8 oz	28-Sep	0	0	0.5	0.5	0.3 a
Defend (4F) 12 fl oz	30-Oct					
Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz + Nutri Grow 3 fl oz	30-Oct	0	1 ^a	0	0	0.3 a
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz + PCNB (75 WP) 4 oz	30-Oct	0.5 (0.3 ^a)	0.5	0	0	0.3 a
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz + Dac. Weather Stik (6F) 3.6 fl oz	30-Oct	0.3 ^a	0	0.5 ^a	0.3 ^a	0.3 a
Turfcide 400 9 fl oz + Teremec SP 4.5 oz	30-Oct	0	0	1	0.3	0.3 a
Ch 26GT 4 fl oz + Heritage 0.4 oz + Turfcide 400 6 fl oz	30-Oct	0.5 ^a	0.3	0.3	1	0.5 a

Dac Weather Stik 5.5 oz + Heritage 0.4 oz + Banner Maxx 2 fl oz	30-Oct	1 ^a	0.3 ^a	0.3 ^a	0.5 ^a	0.5 a
Spectro (90WDG) 5 oz + Nutri Grow 3 fl oz	28-Sep	1	0.5	0.3	0.3	0.5 a
Defend (4F) 12 fl oz	30-Oct					
Spectro (90 WDG) 4 oz + Defend (4F) 8 fl oz	30-Oct	0	0.3	0	2	0.6 a
Eagle (40 WSP) 0.6 oz + Turfcide 400 12 fl oz	30-Oct	0	2	0.3	0	0.6 a
Scotts F + FII 2X	30-Oct	0	3	0	0	0.8 a
Ch 26GT 4 fl oz + Dac Ultrex 5.5 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	3 ^b	0	0	0	0.8 a
Ch 26GT 4 fl oz + Prostar 3.75 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	0	0	0	3	0.8 a
Medallion (50 WG) 0.5 oz + Banner Maxx 3 fl oz	30-Oct	0.5	1	0	2	0.8 a
Spectro (90 WDG) 8 oz	28-Sep	0	0.3	3	0	0.8 a
Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz	30-Oct					
Bayleton (50WP) 2 oz + Turfcide 400 12 fl oz	30-Oct	0	3	0.3	0	0.8 a
Ch. 26GT 4 fl oz + Signature 4 oz + Turfcide 400 8 fl oz	28-Sep, 30-Oct	1	2	0	0.5	0.9 a
Ch 26GT 4 fl oz + Prostar 3.75 oz + Signature 4 oz	28-Sep, 30-Oct	0	0.5	0.5 ^a	3 ^a	1.0 ab
Turfcide 400 12 fl oz	30-Oct	0.3	0.3	1	3	1.1 ab
Turfcide 400 9 fl oz + Fore (80W) 8 oz	30-Oct	0	0	0	5	1.3 ab
Dac Weather Stik 5.5 oz + Heritage 0.4 oz	30-Oct	3 ^a	2 ^a	0.3 ^a	0.3 ^a	1.4 ab
Dac Weather Stik 5.5 oz	30-Oct	5 ^a	0.3 ^a	1 ^a	0.3 ^a	1.6 ab
Ch 26GT 8 fl oz + Dac. Ultrex 4 oz + Turfcide 400 12 fl oz	30-Oct	7	0	0	0	1.8 ab
Spectro (90 WDG) 5 oz	28-Sep	0	2	2	5	2.3 a-c
Spectro (90 WDG) 6 oz + Defend (4F) 8 fl oz	30-Oct					
Defend (4F) 12 fl oz	30-Oct	7 (3 ^a)	0	0	2	2.3 a-c
Heritage 0.4 oz + Banner Maxx 2 fl oz	30-Oct	5 (4.8 ^a)	0.5 ^a	0.5	3 (2 ^a)	2.3 a-c
Ch. 26GT 4 fl oz + Prostar (70WP) 3.75 oz	28-Sep, 30-Oct	1 ^a	1 ^a	7 ^a	0.3	2.3 a-c
Anderson TeeTime 10-0-14 6.66 lbs	30-Oct	7	0	2	0.5	2.4 a-c
Spectro (90 WDG) 8 oz + Nutri Grow 3 fl oz	28-Sep	0.5	0.5	0	10	2.8 a-c
Defend (4F) 12 fl oz	30-Oct					
Lebanon LF2 8 lbs	30-Oct	10	1	0.5	0.3	2.9 a-c
Teremec SP 9 oz	30-Oct	3 ^a	2	12 ^a	2	4.8 a-d
Medallion (50 WG) 0.25 oz + Banner Maxx 2 fl oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	2 (0.3 ^a)	5	10 (2 ^a)	2	4.8 a-d
Banner Maxx 4 fl oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	5 ^a	0.3 ^a	2 ^a	12 (2 ^a)	4.8 a-d
L-0405 6 lbs	30-Oct	5	0.3	20	0.25	6.4 a-d
Ch. 26GT 4 fl oz + Ch. Triton 1 fl oz	28-Sep, 30-Oct	12 ^a	15 ^a	0.5 ^a	0	6.9 a-d
Medallion (50 WG) 0.5 oz	30-Oct	7	15	5	15	10.5 a-d
Manhandle 10 oz	30-Oct	25	10	5	7	11.8 b-d

		(5 ^a)		(3 ^a)	(0.5 ^a)	
Prostar 3.75 oz + Ch. Triton 1 fl oz	28-Sep, 30-Oct	5 ^a	10 ^a	7 ^a	30 ^a	13.0 cd
Medallion (50 WG) 0.5 oz + CGA 245704 (50 WP) 0.66 gm	30-Oct	30	0	0.5	25	13.9 de
Spectro (90WDG) 5 oz ----- Defend (4F) 12 fl oz	28-Sep 30-Oct	1	2	0.5	55	14.6 de
Ch. 26GT 4 fl oz + Signature 4 oz	28-Sep, 30-Oct	25 (2 ^a)	2 ^a	20 (1 ^a)	15 (2 ^a)	15.5 de
Control		3 ^a	40 ^a	30 ^b (7 ^a)	25	24.5 ef
Medallion (50 WG) 0.5 oz - Gowan (50 WG)	30-Oct	25	10	0	80	28.8 f
L-0406 6 lbs	30-Oct	40 (5 ^a)	30 (5 ^a)	25 (3 ^a)	30	31.3 f

^aDisease present is Microdochium patch only. When represented in (), the Microdochium patch is part of the total disease rating.

^bSuperficial infection.

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

MELTING OUT (*DRESCHLERA POAE*)

This study was set up on Kenblue Kentucky bluegrass at the Hancock Turfgrass Research Center, East Lansing, MI. The study consisted of four replicates of each treatment set up in a randomized complete block design with plots measuring 3' x 9' with 1' alleys. Plots were mowed at 2.5". Treatments were applied preventively beginning on May 3 using a CO₂ backpack sprayer at 34 PSI with two 8002E flat fan nozzles. Subsequent applications for 14-day treatments were made on May 18 and May 31, for 21-day treatments on May 23, and for 28-day treatments on May 31. The spray volume used was 48 gallons/acre. In addition to dormant fertility in the fall of 2000, urea fertilizer was applied on June 3 at a 1/8 # nitrogen/1000 ft². Plots were rated on a 0-10 scale where 0 = no disease and 10 = 100% of the leaves infected (Table 3). Data were analyzed with ANOVA and means were separated with LSD (p = 0.05). No phytotoxicity was observed in this study this season.

As the data in table 3 indicate, all treatments gave statistically significant control of melting out. again, as we saw last year, disease pressure was relatively light.

Table 3. Melting Out.

Hancock Turfgrass Research Center, East Lansing, MI						
Rating Date: June 12, 2001						
Rating Scale: 0-10 where 0 = best, 10 = worst, 3 = acceptable.						
Treatment Rate/1000 sq ft	Interval (days)	I	II	III	IV	Mean (LSD^a)
Insignia 0.9 oz	28 day	2	2	2	2	2.0 a
Insignia 0.5 oz	14 day	2	1	3	3	2.3 a
Honor 0.2 oz	28 day	2	3	3	2	2.5 a
Chipco 26GT 4 fl oz	21 day	3	2	3	2	2.5 a
Honor 0.2 oz	14 day	2	3	4	3	3.0 a
Control (Fertilized)	--	6	5	5	4	5.0 b

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

SUMMER STRESS IN BENTGRASS

This trial was conducted on a Penncross creeping bentgrass green at the Hancock Turfgrass Research Center, East Lansing, MI. The plot area was mowed initially at 0.157" and taken down to 0.125". Fertility was as listed below. 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 34 PSI in a 48 GPA spray volume using a CO₂ backpack sprayer and a single 8002E tee-jet flat fan nozzle. Initial treatment application was on June 15. Re-applications were made on intervals as indicated in Table 4. Treatments on a 14 day interval were applied on 6/15, 6/28, 7/13, 7/26, and 8/9. A ½ # nitrogen 1000 ft² application was made on 5/28 with subsequent fertilizer applications of 1/8 # nitrogen ft⁻² on 6/29, 7/13, 7/26; and 1/10 # applied on 8/14 and 8/20. Due to the variety of fungicide combinations tested in this study, no additional chemical applications were made to control dollar spot. Quality ratings were visually estimated using a 1 to 10 scale, where 1 = poor, 10 = excellent, and 7 = acceptable. Data were analyzed using ANOVA and means separated by LSD (p = 0.05).

The Chipco Signature/Daconil Ultrex combination treatment provided significantly better turfgrass quality than the untreated control for the entire duration of the study. The quality of the various treatments varied throughout the study, and many treatments provided improved quality over the untreated control. During August, the most stressful period of the study, the following treatments provided significant improvement over the control: Chipco Signature/Chipco 26GT, Heritage, Chipco Signature/Triton, Chipco Signature/Prostar, Heritage/Banner Maxx, and the Primo Maxx/Banner Maxx/Heritage/Daconil Ultrex series.

Table 4. Summer Bentgrass Decline 2001.

Hancock Turfgrass Research Center, East Lansing, MI						
Rating Scale: Mean quality ratings; 1 to 10, 1 = poor and 7 = acceptable.						
Treatment and Rate/1000 sq ft	Interval (Days)	9-Jul LSD^a	19-Jul	1-Aug	17-Aug	24-Aug
Chipco Signature 4 oz + Ch 26 GT 4 fl oz	14	7.3 b	7.0 b-d	7.0 b-d	6.3 bc	7.0 b
Chipco Signature 4 oz + Daconil Ultrex 3.2 oz	14	8.0 a	8.0 a	8.0 a	7.0 a	6.8 bc
Heritage 0.2 oz	14	6.5 c	6.5 d-f	6.8 b-e	6.8 ab	6.8 bc
Chipco Signature 4 oz + Triton 1 fl oz	14	7.3 b	7.5 ab	7.5 ab	6.8 ab	7.8 a
Chipco Signature 4 oz + Prostar 2.2 oz	14	6.8 bc	6.8 c-e	7.3 a-c	6.8 ab	7.0 b
TS-LF300 2.5 gal/A	14	6.8 bc	6.8 c-e	6.5 c-f	5.8 d	6.3 cd
TS-LF300 2.5 gal/A + Dac. Ultrex 3.2 oz	14	7.0 bc	7.0 b-d	7.0 b-d	6.3 b-c	6.5 b-d
Heritage 0.2 oz + Banner Maxx 1 fl oz	21 ^b	6.8 bc	6.8 c-e	6.8 b-e	7.0 a	7.0 b
Dac. Ultrex 3.2 oz + Primo Maxx 0.125 fl oz	14 (6/15)	6.8 bc	6.5 d-f	7.5 ab	7.0 a	7.0 b
Dac. Ultrex 3.2 oz + Banner Maxx 1 fl oz + Primo Maxx 0.125 fl oz	14 (6/28)					
Heritage 0.2 oz + Banner Maxx 1 fl oz + Primo Maxx 0.125 fl oz	14 (7/13)					
Heritage 0.2 oz + Dac. Ultrex 3.2 oz + Primo Maxx 0.125 fl oz	14 (7/26)					
Banner Maxx 1 fl oz + Primo Maxx 0.125 fl oz	14 (8/9)					

Dac. Ultrex 3.2 oz	14	7.3b	7.0 b-d	7.3 a-c	6.0 cd	6.3 cd
Macrosorb 2 fl oz	14	6.5 c	6.3 ef	5.8 f	5.8 d	6.0 d
Dac. Ultrex 1 oz	14	7.0 bc	6.8 c-e	6.3 d-f	6.0 cd	6.0 d
Macrosorb 2 fl oz + Dac. Ultrex 1 oz	14	7.0 bc	7.0 b-d	6.0 ef	6.3 bc	6.3 cd
Quelant-CA 2 oz	14	6.5 c	6.0 f	6.0 ef	6.3 bc	6.5 b-d
MKP 5#/A	14	7.0 bc	6.5 d-f	6.0 ef	5.8 d	6.3 cd
MKP 5#/A + Dac. Ultrex 1.5 oz	14	7.3 b	7.3 bc	6.8 b-e	6.5 a-c	6.3 cd
Dac. Ultrex 1.5 oz	14	7.3 b	7.3 bc	6.5 c-f	6.0 cd	6.0 d
Control (Fertilized)	--	7.0 bc	6.0 f	6.0 ef	5.8 d	6.0 d

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

^bTreatment applied on the following dates: 6/15, 7/6, 7/13, 7/26, and 8/15.

SUMMER STRESS IN ANNUAL BLUEGRASS

This trial was conducted on a *Poa annua* fairway at the Hancock Turfgrass Research Center, East Lansing, MI. The plot area was mowed at 0.5" and fertility was as listed below with fertilizer applications being made on a 14-day schedule. 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 34 PSI in a 48 GPA spray volume using a CO₂ backpack sprayer and a single 8002E tee-jet flat fan nozzle. Initial application of treatments was on June 14. Re-applications were made on intervals as indicated in Table 5. Treatments on a 14 day interval were applied on 6/14, 6/28, 7/13, 7/27, and 8/9; and those on a 21 day interval on 6/14, 7/6, 7/27, and 8/15. Fertilizer applications were made as follows: 1/4 # nitrogen 1000 ft² on 29 June, 12 July, 27 July; 1/8 # nitrogen on 19-July; 1 # N on 7-Aug; and 1/10 # nitrogen on 14 Aug. Due to the varied fungicide combinations tested in this study, no additional chemical applications were made to control dollar spot. Quality ratings were visually estimated using a 1 to 10 scale, where 1 = poor, 10 = excellent, and 7 = acceptable. Data were analyzed using ANOVA and means separated by LSD ($p = 0.05$).

Several treatments provided significant improvement in turf quality compared to the control during the entire study. These treatments include: Chipco Signature/ Daconil Ultrex, Chipco Signature/Chipco 26GT, Heritage/Banner Maxx, TS-LF300/Daconil Ultrex, Daconil Ultrex alone (3.2 oz/1000 ft²), and Macrosorb/Daconil Ultrex. The TS-LF300/Daconil Ultrex combination and Daconil Ultrex alone at a comparable rate of chlorothalonil were not significantly different during the study duration. Similarly, although the Macrosorb/Daconil Ultrex treatment provided significant improvement compared to the control, it did not provide improvement over the Daconil Ultrex alone at the same rate. During the August ratings, the Primo Maxx/Banner Maxx/Daconil Ultrex/Heritage series treatment was among the best in turfgrass quality as was Heritage/Banner Maxx, Chipco Signature/Triton, Chipco Signature/Daconil Ultrex, and Chipco Signature/Chipco 26GT. Other treatments in the study provided significant improvement in turf quality compared to the control at some point during the study, but this difference was not consistent for the entire course of the study.

Table 5. Annual Bluegrass Summer Decline 2001.

Hancock Turfgrass Research Center, East Lansing, MI						
Rating Scale: Mean quality ratings; 1 to 10, 1 = poor and 7 = acceptable.						
Treatment and Rate/1000 sq ft	Interval (Days)	9-Jul LSD^a	17-Jul	3-Aug	17-Aug	24-Aug
Chipco Signature 4 oz + Ch 26 GT 4 fl oz	14	6.8 ab	6.3ab	7.0 b	7.3a-c	8.0 a
Chipco Signature 4 oz + Daconil Ultrex 3.2 oz	14	7.0 a	6.8 a	8.0 a	7.8 a	7.8 ab
Heritage 0.2 oz	14	6.3 b-d	6.0 a-c	6.0 c-f	5.8 e-g	6.0 de
Chipco Signature 4 oz + Triton 1 oz	14	6.5 a-c	6.5 ab	6.3 b-e	6.5 c-e	7.3 a-c
Chipco Signature 4 oz + Prostar 2.2 oz	14	6.5 a-c	6.0 a-c	6.0 c-f	6.3 d-f	5.8 de
TS-LF300 2.5 gal/A	14	5.8 de	5.3 cd	5.3 f	5.0 g	5.8 de
TS-LF300 2.5 gal/A + Dac. Ultrex 3.2 oz	14	6.5 a-c	6.5 ab	6.8 bc	7.0 a-d	7.0 bc
Heritage 0.2 oz + Banner Maxx 1 fl oz	21	7.0 a	6.5 ab	7.0 b	7.0 a-d	7.8 ab
Dac. Ultrex 3.2 oz + Primo Maxx 0.25 fl oz	21 (6/14)	6.0 c-e	5.8 b-d	5.8d-f	7.3 a-c	8.0 a
Dac. Ultrex 3.2 oz + Banner Maxx 1 fl oz + Primo Maxx 0.25 fl oz	21 (7/6)					
Heritage 0.2 oz + Banner Maxx 1 fl oz + Primo Maxx 0.25 fl oz	21 (7/27)					
Heritage 0.2 oz + Dac. Ultrex 3.2 oz + Primo Maxx 0.25 fl oz	21 (8/15)					
Banner Maxx 1 fl oz + Primo Maxx 0.25 fl oz	21 ^b					
Dac. Ultrex 3.2 oz	14	6.3 b-d	6.3 ab	6.8 bc	6.8 b-d	7.0 bc
Macrosorb 2 fl oz	14	6.0 c-e	5.8 b-d	5.8 d-f	5.8 e-g	5.3 e
Dac. Ultrex 1 oz	14	6.3 b-d	5.8 b-d	6.0 c-f	6.5 c-e	6.5 cd
Macrosorb 2 fl oz + Dac. Ultrex 1 oz	14	6.8 ab	6.3 ab	6.5 b-d	6.8 b-d	6.5 cd
Quelant-CA 2 oz	14	6.0 c-e	5.8 b-d	5.3 f	5.5 fg	5.3 e
MKP 5#/A	14	6.0 c-e	5.0 d	5.3 f	5.6 e-g	5.3 e
MKP 5#/A + Dac. Ultrex 1.5 oz	14	6.5 a-c	6.5 ab	6.0 c-f	6.3 d-f	6.5 cd
Dac. Ultrex 1.5 oz	14	6.5 a-c	5.8 b-d	6.0 c-f	6.3 d-f	6.5 cd
Control (Fertilized)	--	5.5 e	5.3 cd	5.5 ef	5.0 g	5.5 e

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

BROWN PATCH (*RHIZOCTONIA SOLANI*)

Study A

Brown patch study A was established on a creeping bentgrass green at the Hancock Turfgrass Research Center, East Lansing, MI. The plot area was mowed at 0.157". The study was a randomized complete block design with four replicates of each treatment. Plots measured 2' x 4.5' with 1' alleys. Treatments were applied using a CO₂ backpack sprayer at 48 GPA and 34 PSI with a single 8002E tee jet flat fan nozzle. All treatments were applied beginning on 6/26

with the exception of TD 2390 which was applied on 7/16 and 7/30. Re-application intervals for all other treatments were as listed in Table 6 with the 10 day interval treatment applied on 6/26, 7/3, 7/16, 7/26, 8/6, and 8/15; 14 day treatments on 6/26, 7/12, 7/24, and 8/6; 21 day treatment on 6/26, 7/16, and 8/6; and 28 day treatment on 6/26 and 7/24. Subdue Maxx was applied at 1 oz/1000 ft² on 7/11, 7/26, and 8/6 to prevent a *Pythium* blight outbreak. The study area was inoculated (6/27, 7/5, 7/16) with *Rhizoctonia solani* growing on a sand/cornmeal mixture using a drop spreader at approximately 2.5 #/1000 sq ft. The plot area was covered using a blue vinyl tarp to encourage disease development. Fertility was as follows: 6/15 (1/2 # N), 6/20 (1/4 # N), 6/22 (1/2 # N), 7/5 (1/4 # N), 7/19 (1/4 # N), and 8/2 (1/4 # N). Plots were rated for percent area blighted by brown patch (Table 6.) Data were analyzed using ANOVA and means separated with LSD (p = 0.05).

In Study A on the green, all treatments but one provided significant brown patch control when compared to the control plots. None of those treatments tested were significantly different from each other with percent disease means ranging from 0-10%. The control averaged 32.5% disease. No phytotoxicity was observed.

Table 6. Study A – Brown Patch Green, Hancock Turfgrass Research Center.

Rating Date: July 24, 2001							
Rating Scale: Percent plot area with brown patch.							
Treatment	Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean (LSD^a)
Prostar	2.2 oz	14	0	0	0	0	0 a
Insignia 20WG	0.5 oz	14	0	0	0	0	0 a
SysStar WDG	3 oz	21	0	0	0	0	0 a
Heritage	0.2 oz	14	0	0	0	0	0 a
Honor	0.2 oz	14	1	0	0	0	0.3 a
Dac Ultrex	3.2 oz	10	0	0	0	5	1.3 a
Endorse	4 oz	14	0	1	5	0	1.5 a
Insignia 20WG	0.9 oz	28	0	10	0	0	2.5 a
TD 2390	6 oz	14	5	0	0	5	2.5 a
Spectro 90 WDG	4 oz	14	0	10	0	0	2.5 a
WAC79 + Spectro 90 WDG	5 fl oz + 4 oz	14	0	0	5	5	2.5 a
Insignia alt with Chipco 26GT	0.5 oz / 4.0 fl oz	14	10	5	5	15	8.8 a
Chipco 26 GT	4 fl oz	14	5	10	5	15	8.8 a
Endorse	6 oz	14	0	15	20	0	8.8 a
SysTec	1.5 oz	14	5	25	5	5	10 a
Control (Fertilized)	--	--	40	60	20	10	32.5 b
WAC79	5 fl oz	14	30	50	50	25	38.8 b

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

Study B

Study B was set up on a perennial ryegrass fairway mowed at ½". Plots measured 3' x 6' with 1' alleys. The study set up was the same as above except for the fertility. Re-application intervals were as listed in Table 7 with the 10 day interval treatment applied on 6/26, 7/6, 7/16, 7/26, 7/31, 8/6, and 8/15; 14 day treatments on 6/26, 7/11, 7/24, and 8/6; 21 day treatments on 6/26, 7/16, and 8/6; and 28 day treatments on 6/26 and 7/24. The exception was TD 2390 which was applied on 7/16 and 7/24 only. Subdue Maxx was applied at 1 oz/1000 ft² on 7/11, 7/26, and 8/6 to prevent a *Pythium* blight outbreak. The study area was inoculated (6/27, 7/5, 7/16) with *Rhizoctonia solani* growing on a sand/cornmeal mixture using a drop spreader at approximately 2.5 #/1000 sq ft. Fertility for Study B was as follows: 6/13 (1/8 # N), 6/20 (1/2 # N), 6/22 (1/2 # N), 6/27 (1/2 # N), 7/5 (1/2 # N), 7/19 (1/2 # N), 8/3 (1/2 # N), and 8/14 (1/8 # N). Plots were rated for percent area blighted by brown patch (Table 7). Data were analyzed using ANOVA and means separated with LSD (p = 0.05).

In Study B on ryegrass, there was very little disease development. However, the rating on Aug. 8 (Table 7) shows similar results as did Study A. All treatments but one provided significant brown patch control when compared to the control plots.

Table 7. Study B – Brown Patch Rye, Hancock Turfgrass Research Center.

Rating Date: August 10, 2001							
Rating Scale: Percent plot area with brown patch.							
Treatment	Rate/1000 sq ft	Interval (Days)	I	II	III	IV	Mean (LSD^a)
Prostar	2.2 oz	14	0	0	0	0	0.0 a
Insignia 20WG	0.5 oz	14	0	0	0	0	0.0 a
Insignia 20WG	0.9 oz	28	0	0	0	0	0.0 a
Insignia alt with Chipco 26GT	0.5 oz / 4.0 fl oz	14	0	0	0	0	0.0 a
Honor	0.2 oz	14	0	0	0	0	0.0 a
Spectro 90 WDG	4 oz	14	0	0	0	0	0.0 a
Endorse	4 oz	14	0	0	0	0	0.0 a
Endorse	6 oz	14	0	0	0	0	0.0 a
SysStar WDG	3 oz	21	0	0	0	0	0.0 a
SysTec	1.5 oz	14	0	0	0	0	0.0 a
Heritage	0.2 oz	14	0	0	0	0	0.0 a
Dac Ultrex	3.2 oz	10	0	0	0	0	0.0 a
WAC79 + Spectro 90 WDG	5 fl oz + 4 oz	14	0	0	0	3	0.8 ab
TD 2390	6 oz	14 ^b	7	3	0	1	2.8 ab
Chipco 26 GT	4 fl oz	14	7	15	0	0	5.5 bc
WAC79	5 fl oz	14	10	20	0	10	10 cd
Control (Fertilized)	--	--	5	5	10	25	11.3 d

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

^bTreatment applied on 7/16 and 7/24 only.

RED THREAD (*LAETISARIA FUCIFORMIS*)

This study was set up on a ryegrass fairway height turf at Hancock Turfgrass Research Center, East Lansing, MI. The study consisted of four replicates of each treatment set up in a randomized complete block design with plots measuring 6' x 6' with 1' alleys. Treatments were applied using a CO₂ backpack sprayer at 48 GPA and 34 PSI with two 8002E flat fan nozzles. Treatments were applied for the first time on May 31. All treatments were reapplied on 6/13, 7/12, 7/26, and 8/6. Fertilizer was applied as follows: 6/5 (1/4 # N), 6/19 (1/4 # N), 7/12 (1/4 # N), and 7/31 (1/4 # N). Plots were rated for percent area diseased with red thread. Means are presented in Table 8. Data were analyzed with ANOVA and means separated with LSD (p = 0.05).

All of the treatments tested in this study provided significant red thread control compared to the untreated control. While red thread continued to develop in the control plots, by the July 9 rating, all treatments had almost totally eradicated the disease.

Table 8. Red Thread 2001.

Hancock Turfgrass Research Center, East Lansing, MI							
Rating Scale: Percent plot area with red thread.							
Treatment	Rate/1000 sq ft	Interval (Days)	Mean ^a 6/12	Mean 6/25	Mean 7/9	Mean 7/17	Mean 7/26
Endorse	4 oz	14	0.4 a	0 a	0 a	0 a	0 a
Endorse	6 oz	14	0.4 a	0.3 a	0.1 a	0 a	0 a
Chipco 26 GT	4 fl oz	14	0.3 a	0.8 a	0 a	0 a	0 a
Spectro 90WDG	4 oz	14	1.6 a	1.1 a	1.0 a	0.7 a	0 a
Control (Fertilized)	--	--	6.8 b	8.5 b	8.0 b	7.3 b	10.0 b

^aTreatment means within each rating date followed by the same letter do not differ significantly (LSD, p = 0.05).

SUMMER PATCH (*MAGNAPORTHE POAE*)

The study was established on an irrigated annual bluegrass fairways at the Dearborn Country Club in Dearborn, MI. The study consisted of four replicate 6' x 9' plots in a random block design. Treatments were applied preventively with a CO₂ backpack sprayer at 34 PSI and 48 GPA. Treatments were initiated on 6/11/01 when temperatures reached 75°F at a 2" soil depth. The 14 day treatments were applied on 6/11, 6/25, 7/9, 7/24, and 8/7. The 21 day treatments were applied on 6/11, 7/2, and 7/24. The 28 day treatments were applied on 6/11, 7/9, and 8/7. The Banner Maxx/Heritage treatment was applied on 6/11, 6/25, 7/9, and 8/7. Fertility was maintained at ¼ # N/1000 ft²/month. Data represent percent plot area diseased in study B on July 30, 2001 and a later rating on September 6. The 9/6 rating was taken after some treatments had expired because disease pressure declined as usual in August and then unexpectedly redeveloped in September. Those data are presented for unexpired treatments or treatments whose longevity outlasted their reapplication interval.

As Table 9 indicates, at the time of the 7/30 rating, most fungicide treatments were providing significant summer patch control compared to the untreated control. Because disease pressure was moderate on 7/30, statistical separation of the treatment means was limited. Treatment separation, statistically, was much more complete at the time of the 9/6 rating. As the 9/6 data indicate, several treatments, including Insignia, Banner Maxx, and Heritage, exhibited control of summer patch even after the treatment had expired by more than twice the recommended time period. So although some disease did develop in plots that had very little disease earlier in the season, these treatments still provided excellent control considering that the treatment had expired but was still showing significant efficacy after more than twice their application interval. No phytotoxicity was observed during the course of this study.

Table 9. Summer Patch, Study 2001.

Dearborn Country Club, Dearborn, MI				
Rating Scale: Percent plot area exhibiting summer patch symptoms (yellow, thin).				
Treatment	Rate/1000 sq ft	Interval (Days)	Jul 30^a	Sep 6
Heritage	0.2 oz	28	0.0 e	2.0 hij
Insignia 20WG	0.5 oz	14	0.0 e	0 j ^c
Lynx 45WP + Compass 50WG	1.11oz + 0.2 oz	21 (3 apps)	0.0 e	0.8 ij
Heritage 50 WG	0.4 oz	21 (3 apps)	0.0 e	1.3 ij
Heritage 50 WG	0.4 oz	28 (2 apps) ^b	0.0 e	1.5 ij
Banner Maxx + Medallion	2.0 fl oz + 0.33 oz	14	0.0 e	8.8 f-j ^c
Heritage	0.1 oz	14	0.0 e	3.8 hij ^c
Macrosorb + Heritage	2 fl oz + 0.1 oz	14	0.0 e	0.3 j ^c
Banner Maxx	4 oz	28 (2 apps) ^b	0.5 de	12.8 e-i
Lynx 45WP	1.11 oz	21 (3 apps)	0.5 de	0 j
Heritage 50 WG	0.2 oz	21 (3 apps)	0.8 de	0.5 j
Honor 50WG	0.2 oz	28	1.3 de	1.5 ij
Heritage 50 WG	0.3 oz	21 (3 apps)	1.8 de	0.5 j
Chipco Triton	2.0 fl oz	28	2.0 de	16.5 efg
Banner Maxx	2.0 fl oz	14	2.3 de	7.0 f-i ^c
Heritage 50 WG + Banner Maxx	0.2 oz + 2.0 fl oz	28	2.5 de	1.3 ij
Chipco Triton	1.0 fl oz	28	3.8 c-e	17.5 def
Insignia 20WG	0.9 oz	28	3.8 c-e	0.8 ij
TADS 12529	8.5 gm	28	5.0 c-e	26.3 bcd
Banner Maxx <i>followed by</i>	2.0 fl oz	14 (first 2 apps)	5.0 c-e	5.0 ghi
Heritage	0.4 oz	28 (next 2 apps)		
Chipco Triton	0.5 fl oz	28	6.3 c-e	26.3 bcd
Compass 50 WG	0.2 oz	21 (3 apps)	6.3 c-e	25.0 cd
Bayleton 50WP	1.0 oz	21 (3 apps)	6.5 c-e	30.0 bc
TADS 12529	4.25 gm	28	7.0 b-e	37.5 ab

Chipco Triton + TADS13093	1.0 fl oz	28	7.5 b-d	26.3 bcd
Bayleton 50WP + Compass 50WG	1.0 oz + 0.2 oz	21 (3 apps)	10.8 bc	18.8 cd
Macrosorb	2 fl oz	14	13.8 ab	NA ^d
BAS 510F	0.18 oz	28	19.3 a	43.8 a
Control (Fertilized)	--	--	20.0 a	37.5 ab

^aMeans followed by the same letter within the same rating date are not significantly different (LSD, p = 0.05).

^bTreatments applied on 6/11 and 7/9 only.

^cTreatment expired – 30 days since last application on 8/7, however, summer patch control still observed.

^dTreatment expired – 30 days since last application on 8/7.

MICRODOCHIUM PATCH (*MICRODOCHIUM NIVALE*)

This curative study was established on a bentgrass green at the Hancock Turfgrass Research Center on the MSU campus in a location where Microdochium patch was beginning to develop. The study consisted of four replicate 2' x 6' plots laid out in a random block design. Treatments were applied initially on April 28, 2001 using a single nozzle (TeeJet flat fan) CO₂ backpack sprayer at 30 PSI and 48 GPA. Treatments were reapplied on a 14 day interval on 5/13, 5/23, and 6/8. Data were analyzed using ANOVA and means separated with LSD (p = 0.05).

Consyst and Fore both provided excellent recovery from Microdochium Patch at the time of the May and June ratings (Table 10). By the June ratings, Chipco 26GT provided significant recovery compared to the control, however, it didn't perform as well as expected. This could possibly be due to the curative nature of this study as compared to a preventive study. No phytotoxicity was observed during the course of this study.

Table 10. Microdochium Patch 2001.

Hancock Turfgrass Research Center, East Lansing, MI						
Rating Scale: Mean percent recovery from pre-treatment rating on 4/28/01.						
Treatment	Rate/ 1000 sq ft	Interval	14-May*	29-May	5-Jun	12-Jun
Consyst WDG	8 oz	14 day	28.1 a	88.9 a	90.6 a	97.0 a
Fore WP	6 oz	14 day	7.1 a	41.1 ab	73.7 ab	87.1 a
Consyst WDG	6 oz	14 day	10.7 a	68.1 ab	78.0 a	88.2 a
Ch 26 GT	4 fl oz	14 day	2.7 ab	33.6 c	50.7 b	61.6 b
Control	--	--	-38.4 b	14.3 c	8.9 c	8.0 c

*Means followed by the same letter within the same rating date do not differ significantly (LSD, p = 5%).

LOCALIZED DRY SPOT

This was a two-year study established and maintained on a creeping bentgrass green at the Hancock Turfgrass Research Center, East Lansing, MI. Plots measured 6' x 9' with four replicates set up in a randomized complete block design. The Nature Safe was applied by hand and watered in. The Surf Side 37A treatment was sprayed on using a CO₂ backpack sprayer with two 8002E flat fan nozzles at 34 psi and 48 GPA. These treatments were drenched in with water following each application. Treatments were applied as indicated in Table 11 with Nature Safe being applied on 5/16 (1/2 # N), 5/30 (1/2 # N), 6/13, 7/10, 8/7, and 9/5 and Surf Side 37A being applied on 6/27, 7/27, and 8/29. Fertilizer was applied to the control and the Surf Side 37A treatments on the following dates so that they received the same amount of nitrogen as the treatment which only received Nature Safe: 5/22, 6/13, 7/10, and 8/7. Plots were rated for percent area with localized dry spot symptoms including wilting and thinning of turf. Data were analyzed using ANOVA and means separated with LSD (p = 0.05).

None of the treatments tested here provided significant control of localized dry spot compared to the fertilized control. The plots treated with the wetting agent, Surf Side 37A, did have the least amount of localized dry spot of all of the plots, but this difference was not statistically significant. No phytotoxicity was observed during the course of this study.

Table 11. Localized Dry Spot 2001.

Hancock Turfgrass Research Center, East Lansing, MI						
Rating Scale: Percent plot area affected by localized dry spot.						
Treatment Rate/1000 ft²	Interval (Days)	Mean^a 7/9	Mean 7/19	Mean 7/25	Mean 8/1	Mean 9/5
Surf Side 37A 6oz	28	33.3 a	25.0 a	16.6 a	7.5 a	18.3 a
Nature Safe 1/2#N (2 apps. Apr, 1 app. May-Sep)	28	60.0 a	43.3 a	43.3 a	20.0 a	25.0 a
Control (Fertilized)	--	50.0 a	43.3 a	20.0 a	13.8 a	31.7 a

^aTreatment means followed by the same letter within the same rating date are not significantly different (LSD, p = 0.05).

MOSS

This study was established and maintained on a creeping bentgrass green. Plots measured 2' x 3'. Treatments were applied as indicated in Table 12 with the 7 day treatment applied on 6/22, 6/29, 7/3, 7/13, 7/19, 7/27, 8/3, 8/9, 8/15, and 8/29; and the 14 day interval treatments on 6/22, 7/3, 7/19, 8/3, 8/15, and 8/29. Fertilizer was applied on 5/28 (1/2 # N), 7/20 (1/8 # N), and 8/17 (1/8 # N). Plots were rated for percent plot area with moss (Table 12). Data were analyzed using ANOVA and means separated with LSD (p = 0.05).

The moss that was in most of the plots was not totally eradicated by the treatments tested. Throughout the study, the moss would go off-color (turn brown) only to return to its green color again. This happened in various treatments as well as in some of the controls and seemed to be

independent of treatment. Although, based on the data in Table 12, some of the treatments provided significant moss reduction compared to the control, none of the treatments totally eradicated the moss. In addition, some phytotoxicity was observed over the course of the study. Spotrete exhibited mild phytotoxicity as a slight darkening of the turf. The high rate of Junction showed no damage early in the trial, but by the end of July, some slight browning was visible. In early September, moderate phytotoxicity was observed in the plots treated with the high rate of Junction only.

Table 12. Moss 2001.

Hancock Turfgrass Research Center, East Lansing, MI							
Rating Scale: Percent plot area with moss.							
Treatment Rate/1000 ft²	Interval (Days)	Mean^a 6/14	Mean 7/9	Mean 7/17	Mean 8/17	Mean 8/29	Mean 9/5
Spotrete 7.5 fl oz	7	0.8 a	0.4 b	0.4 b	0.5 b	0.2 b	0.2 b
Junction 2 oz	14	1.4 a	1.4 ab	0.6 b	1.3 ab	0.8 ab	0.7 b
Junction 4 oz	14	1.0 a	1.3 ab	0.9 ab	1.1 b	0.9 ab	0.9 b
Junction 6 oz	14	1.6 a	2.1 a	1.9 ab	1.5 ab	1.3 ab	1.1 ab
Control (Fertilized)	--	1.9 a	2.4 a	2.3 a	2.5 a	2.2 a	2.1 a

^aTreatment means followed by the same letter within the same rating date are not significantly different (LSD, p = 0.05).

TAKE ALL PATCH (*GAEUMANNOMYCES GRAMINIS*)

Because disease activity occurred in the spring this year, Take All Patch (*Gaeumannomyces graminis*) studies were conducted curatively on a diseased creeping bentgrass fairway at the Golf Club of Michigan, Brighton, MI. The study was set out in four replications of a randomized complete block design utilizing 6' x 9' plots, each of which displayed one or more active take-all patches. Applications were made with a small plot, CO₂ sprayer with two flat fan nozzles at 35 PSI and 96 GPA. Treatments were not watered in. Fertilizer treatments, except urea, were pre-weighed and hand-applied. A pre-treatment disease rating was taken on 5/17, prior to the initial application on 5/17. Treatments were re-applied at the interval cited in the data table (Table 13). The ratings (percent recovery) were taken on 7/11/01 as disease pressure peaked in the study area. Because the study area was lean at the time of treatment initiation, supplemental fertility was applied to all non-fertilizer treatments as follows: ¼ # N (18-3-18) on 5/17, 1/8 # N (urea) on 5/22, ¼ # N (18-3-18) on 6/14, and ¼ # N (18-3-18) on 6/19. Additionally, Daconil Ultrex (3 oz/1000 sq ft) and Subdue Maxx (1 oz/1000 sq ft) were applied to the entire study on 6/28 for dollar spot and Pythium blight control.

Disease pressure in this study peaked in early July and gradually decreased throughout August. No fall disease activity was observed.

As the data in Table 13 indicates, the fungicides Honor, Systec 1998, and Heritage provided significantly better disease recovery than was observed in the control treatment. Also included in this elite group was the urea fertilizer treatment at ½ lb nitrogen/1000 ft² per 14 days. No phytotoxicity was observed in this study this year.

Table 13. Take All Patch Golf Club of Michigan, Brighton, MI.

Rating Date: 7/11/01							
Rating Scale: Mean percent recovery from pre-treatment disease levels on 5/17/01.							
Treatment Rate/1000 sq ft	Application Interval	I	II	III	IV	Mean^a	LSD
Heritage 0.4 oz	May, June (2 apps) ^b	75	80	100	100	88.75	A
SysTec	14 days ^c	100	70	100	75	86.25	A
Urea 1 lb N / month (1/2 lb N / 14 days)	May, June, July, Aug ^d	100	67	80	86	83.25	AB
Honor 0.2 oz	2 fall '01, 2 spring '02 ^e	70	90	100	67	81.75	A-C
SysStar WDG 3.0 oz	14 days ^c	100	80	100	40	80	A-D
Eagle 0.6 oz	14 days ^c	60	90	85	80	78.75	A-D
Insignia 0.9 oz	2 fall '01, 2 spring '02 ^e	100	67	83	50	75	A-D
Eagle 1.2 oz	28 days ^f	50	60	100	72	70.5	A-D
Nitroform 2 lb. N.	May only ^g	-25	43	0	60	19.5	A-E
Urea 1/2 lb. N.	May, June, July, Aug ^d	50	29	43	-50	18	A-E
Nutralene 2 lb. N.	May only ^g	-67	57	0	57	11.75	B-E
Lebanon 18-3-18 1/2 lb. N.	May, June, July, Aug ^d	20	-75	60	33	9.5	C-E
Control	--	20	60	0	-50	7.5	DE
Nitroform 1 lb. N.	May, July ^h	0	-75	20	0	-13.75	EF
Nutralene 1 lb. N.	May, July ^h	-50	0	-40	0	-22.5	EF
Nitroform (38%) 1/2 lb. N.	May, June, July, Aug ^d	0	-60	25	-60	-23.75	EF
Nutralene (40%) 1/2 lb. N.	May, June, July, Aug ^d	-133	-50	20	60	-25.75	EF
Lebanon 18-3-18 1 lb. N.	May, June, July, Aug ^d	-250	43	-133	43	-74.25	F
Heritage 0.2 oz + Banner Maxx 2 fl oz	21 days ⁱ					NA	
Heritage 0.2 oz	21 days ⁱ					NA	

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

^bTreatments applied on 5/17 and 6/14.

^cTreatments applied on 5/31, 6/14, 6/27, 7/11, 7/27, 8/8, and 8/21.

^dTreatments applied on 5/17, 5/31, 6/14, 6/27, 7/11, 7/27, 8/8, and 8/21.

^eTreatments applied on 5/17, 6/14, 7/11, and 8/21.

^fTreatments applied on 5/17, 6/14, 7/11, and 8/8.

^gTreatments applied on 5/17.

^hTreatments applied on 5/17 and 7/11.

ⁱProduct/protocols arrived too late to be applied with rest of treatments. Treatments were applied, but not early enough to have time for recovery before the rating date.

Table 14. Take All Patch Golf Club of Michigan, Brighton, MI.

Rating Rate: 7/21/01							
Quality Rating Scale: 10 (best), 0 (worst), 7 (acceptable).							
Treatment	Rate/1000ft ²	Intervals	I	II	III	IV	Mean
Urea	1/2 lb N/14 days	May, June, July, Aug ^a	7	8	8	8	7.8
Nutralene	1 lb. N	May, July ^b	8	6	8	8	7.5
Heritage	0.4 oz	May, June (2 applications) ^c	8	7	7	7	7.3
Insignia	0.9oz	May, June, July, Aug ^d	7	7	7	7	7.0
Urea	1/2 lb.N	May, June, July, Aug ^d	7	7	7	7	7.0
Eagle	1.2 oz	28 days ^d	7	8	6	7	7.0
SyseTec	5.0 oz	14 days ^a	6	8	7	7	7.0
Honor	0.2oz	May, June, July, Aug ^c	6	7	7	7	6.8
Eagle	0.6oz	14 days ^a	6	7	7	7	6.8
Nitroform	2 lb. N	May only ^f	6	7	6	7	6.5
Lebanon 18-3-18	2 lb. N	May, June, July, Aug ^d	8	6	6	6	6.5
Sys Star WDG	3.0 oz	14 days ^a	7	6	6	7	6.5
Nutralene	2 lb. N	May only ^f	6	6	6	7	6.3
Nutralene (40%)	1/2 lb.N	May, June, July, Aug ^d	7	5	5	7	6.0
Lebanon 18-3-18	1/2 lb. N	May, June, July, Aug ^d	6	6	5	7	6.0
Control	-	-	5	7	6	5	5.8
Nitroform	1 lb. N	May, July ^b	7	5	5	5	5.5
Nitroform (38%)	1/2 lb. N	May, June, July, Aug ^d	5	5	5	6	5.3

^aTreatments applied on 5/17, 5/31, 6/14, 6/27, 7/11, 7/27, 8/8, and 8/21.

^bTreatments applied on 5/17 and 7/11.

^cTreatments applied on 5/17 and 6/14.

^dTreatments applied on 5/17, 6/14, 7/11, and 8/8.

^eTreatments applied on 5/17, 6/14, 7/11, and 8/21.

^fTreatments applied on 5/17 only.

DOLLAR SPOT (*RUTSTROEMIA FLOCCOSUM*)

Study A

Study A was set up in four replicates of a random block design with 2' x 4.5' plots. We applied the liquid treatments with a CO₂ backpack sprayer with a single nozzle (flat fan 8002E TeeJet) boom at 34 psi and 48 GPA. Granular treatments were pre-weighed and hand applied. The host was Emerald creeping bentgrass mowed at 3/16". Fertility was maintained at 3/8 # N/month/1000 ft². Treatments were applied on intervals as listed in Table 15. Treatments on a 3 day interval were applied on: 8/3, 8/6, 8/10, 8/14, 8/18, 8/24, 9/1, 9/7, 9/11, 9/14, and 9/17. The 7 day treatments were applied on 8/3, 8/10, 8/18, 8/24, 9/1, 9/7, and 9/14. The 14 day treatments were applied on 8/3, 8/18, 9/1, and 9/14. The 21 day treatments were applied on 8/3, 8/24, and 9/14. The 28 day treatments were applied on 8/3 and 9/1. Data represent mean percent plot area infected (Table 15).

As the data in Table 15 indicates, dollar spot disease pressure was moderate in this study. Most of the fungicides tested provided significant control of dollar spot on all three rating dates compared to the untreated control. This efficacy was exhibited in the face of increasing disease pressure through the disease peak around 9/22.

Table 15. Putting Green Dollar Spot, Study A – 2001.

Hancock Turfgrass Research Center, East Lansing, MI					
Rating Scale: Mean percent area blighted by dollar spot.					
Treatment Rate/1000 sq ft	Interval (Days)	Mean^a 9/1	Mean 9/14	Mean 9/22	Mean Quality 9/22
Ch 26 GT 4.0 fl oz	14	0.1i	0 o	0.0g	7.0cd
Chipco Triton 0.75 fl oz	14	0.1i	0 o	0.0g	7.5c
Chipco Triton 1.0 fl oz	14	0.1i	0 o	0.0g	8.0bc
Banner Maxx 1.0 fl oz	14	0.0i	0 o	0.0g	8.0bc
Honor 50WG 0.2 oz	14	0.0i	0 o	0.0g	8.0bc
Honor 50WG 0.2 oz alt with Chipco Triton 2.0 fl oz	14	0.4i	0 o	0.0g	7.5c
BAS 510 F 70WG 0.13 oz	14	0.1i	0 o	0.0g	7.8bc
BAS 510 F 70WG 0.18 oz	28	0.7i	0 o	0.0g	7.5c
Concorde SST 720 g /l ai	14	4.1ih	0.1 o	0.0g	8.0bc
Eagle 40WP 0.6 oz	14	0.3i	0 o	0.0g	7.8bc
XF-00044 3.5 oz	14	0.0i	0 o	0.0g	8.0bc
XF-00023 4 oz	14	1.9ih	0.1 o	0.0g	7.8bc
XF-00024 2.5 oz	14	3.0ih	0.1 o	0.0g	8.8ab
XF-00103 4 oz	14	0.9i	0 o	0.0g	9.3a
Dac Ultrex 3.2 oz	14	2.8ih	0 o	0.0g	7.8bc
Banner Maxx 1.0 fl oz + Dac Ultrex 3.2 oz	21	0.5i	0 o	0.0g	8.0bc
Banner Maxx 1.0 fl oz + Heritage 0.2 oz	21	2.7ih	0 o	0.0g	8.0bc
Medallion 0.25 oz + Dac Ultrex 1.8 oz	14	0.9i	0 o	0.0g	7.8bc
Chipco Triton 2.0 fl oz	21	0.0i	0 o	0.1g	7.8bc
Honor 50WG 0.2 oz	28	5.3ih	0 o	0.6g	7.8bc
Spectro 90WDG 4 oz	14	2.5ih	0.9 o	0.8g	8.0bc
Banner Maxx 1.0 fl oz	21	11.8f-h	3.3 m-o	1.0g	7.5c
Concorde DF (82.5% ai)	14	7.5ih	1.9 no	1.4g	7.5c
XF-00059 4 lb	14	23.8c-e	8 l-o	4.0gf	7.0cd
SysStar WDG 3.0 oz	14	7.5ih	11.8 k-n	12.5ef	6.0de
SysTec 1998 1.5 oz	14	10.0g-h	13 k-m	11.75ef	5.8ef
710-140 15 fl oz	3*	22.5de	20 f-k	16.3de	6.3de
710-140 20 fl oz	7	23.0de	18.8 g-k	16.3de	6.0de
140 Base 20 oz	7	10.0g-I	14.0 j-l	16.3de	6.3de
710-140 15 fl oz	7	24.3c-e	15.5 i-l	18.0de	5.3e-h
710-140 10 fl oz	3*	21.3d-f	16.3 h-l	23.8dc	6.0de
0.1 # Urea	3*	28.8a-e	26.3 d-h	23.8dc	5.5e-g
710-140 5 fl oz	3*	30.5a-d	28.8 b-g	28.8bc	4.5g-i
710-140 10 fl oz	7	30.0a-d	24.3 e-j	28.8bc	4.8f-g
710-145 C	7	23.75c-e	28.8 b-g	30.0a-c	4.5g-i

Endorse 6 oz	14	27.5a-e	27.5 c-g	30.0a-c	4.0i-k
710-145 E	7	23.75c-e	27.5 c-g	30.0a-c	3.75i-k
710-140 5 fl oz	7	30.0a-d	31.3 a-e	35.0ab	4.0i-k
710-140 20 fl oz	14	30.0a-d	31.3 a-e	31.3a-c	4.5g-I
Turf Vigor 20 fl oz	14	25.0c-e	28.8 b-g	31.3a-c	4.5g-i
TD 2390 6 oz	14	35.0ab	38.8 ab	31.3a-c	4.5g-i
710-145 B	7	23.8c-e	28.8 b-g	31.3a-c	4.5g-i
0.1 # Urea	7	31.2a-d	26.3 d-h	31.3a-c	4.3h-j
Untreated Control	--	19.3e-g	25 d-i	32.5a-c	4.3h-j
Turf Vigor 20 fl oz	7	33.7abc	33.8 a-e	33.8a-c	4.3h-j
710-145 D	7	25.0c-e	35 a-d	35.0ab	3.75i-k
710-145 F	7	35.0 ab	37.5 a-c	37.5ab	3.0k
710-145 A	7	36.3 a	41.3 a	38.8ab	3.3jk
Endorse 4 oz	14	31.3a-d	30 b-f	40.0a	4.3h-j

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

^bQuality rating scale: 10 = best, 0 = worst, 7 = acceptable.