

**TURFGRASS DISEASE MANAGEMENT REPORT**  
**J.M. Vargas, Jr., A.R. Detweiler, and Nancy Dykema**  
**Department of Botany and Plant Pathology**  
**Michigan State University**

### Dollar Spot (*Rutstroemia floccosum*)

#### Study A

This study was set up on an annual bluegrass fairway at Hancock Turfgrass Research Center, E. Lansing, MI. The design was a randomized complete block with four replicates. Plots were 2' x 6' plots with 1' alleys and were mowed at 0.5". Fertility was maintained at about ¼ #N/1000 ft<sup>2</sup>/month. Treatments were applied beginning on June 27 due to an early disease outbreak with subsequent applications made on a 14 day interval (see Table 1 for initial, pre-treatment rating.) Treatments were applied using a CO<sub>2</sub> backpack sprayer.

All treatments provided significant control of dollar spot compared to the untreated control for the July and August ratings (see Table 1) By the September 13 rating, the 2 oz rate of Daconil Ultrex was not significantly different from the untreated control. Chipco 26GT was the only treatment tested here that provided season-long dollar spot control which would meet industry standards. It should be noted that the September 13 rating was taken 15 days after the last fungicide application. No phytotoxicity was observed in the plot area this season.

<b>Table 1. Fairway Dollar Spot</b>						
<b>Rating Scale: Mean % area blighted by dollar spot</b>						
<b>Treatment Rate/1000 sq ft</b>	<b>Interval (Days)<sup>a</sup></b>	<b>6/27<sup>c</sup> (LSD<sup>b</sup>)</b>	<b>7/12 (LSD<sup>b</sup>)</b>	<b>8/8 (LSD<sup>b</sup>)</b>	<b>9/6 (LSD<sup>b</sup>)</b>	<b>9/13 (LSD<sup>b</sup>)</b>
Ch.26GT 2.0 fl oz	14	1.2 a	1.1 a	2.8 ab	1.4 a	3.8 a
Dac. Ultrex 3.8 oz	14	1.9 a	3.3 ab	2.3 a	6.5 ab	21.3 a
Dac. Ultrex 2.0 oz	14	1.1 a	3.3 ab	13.3 bc	11.8 ab	61.3 b
Control	--	2.0 a	7.0 c	52.5 d	46.3 c	51.3 b

<sup>a</sup> Treatments applied on a 14-day schedule were applied on June 27, July 12 and 25, and August 4 and 29.

<sup>b</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).

<sup>c</sup> Pre-treatment rating.

## Study B

This study was set up in 4 replicates of a randomized complete block design with 2' x 9' plots. We used a CO<sub>2</sub> backpack sprayer with a single nozzle boom at 34 psi and 48 GPA. The host was Emerald creeping bentgrass mowed at 3/16". Fertility was maintained at about 3/8#N/month/1000 ft<sup>2</sup>. The 7-day treatments were applied 7/31, 8/9, 8/15, 8/20, 8/29, 9/5, 9/13 and 9/19. The 14-day treatments were applied 7/31, 8/15, 8/29, and 9/13. The 21-day treatments were applied 7/31, 8/20, and 9/13. The 28-day treatments were applied 7/31 and 8/29. Data represent mean percent plot area infected (Table 2).

As the data in Table 2 indicate, dollar spot disease pressure was severe in this study. The DMI fungicides (Lynx, Eagle) alone, and in combination with Daconil, performed well throughout the rating period. Chipco 26GT also performed well on a 14-day schedule. Surprisingly, Daconil Ultrex at the 3.2 oz/1000 ft<sup>2</sup> rate did not hold up under late September disease pressure. It should be noted that the dollar spot strains in this plot area are benzimidazole-resistant, explaining the fail efficacy of 3336F.

Treatment Rate/1000 sq ft	Interval (Days)	Disease <sup>a</sup> 9/6	Disease <sup>a</sup> 9/13	Disease <sup>a</sup> 9/20	Mean Quality <sup>ab</sup> 9/20
Banner Maxx 1 fl oz	21	3.6 f-h	19.5 g-n	14.5 h-l	5.8
WAC79 2 fl oz + Dac. Ultrex 3.8 oz	14	9.3 e-h	37.0 d-g	30.8 e-g	4.0
WAC79 3 fl oz + Dac Ultrex 3.8 oz	14	11.9 e-h	52.5 a-d	41.3 a-e	3.5
WAC79 4 fl oz + Dac Ultrex 3.8 oz	14	14.3 d-g	57.5 a-c	42.5 a-e	3.5
WAC79 2 fl oz + Protect T/O 5 oz	14	31.3 ab	60.0 ab	42.5 a-e	3.3
WAC79 3 fl oz + Protect T/O 5 oz	14	33.8 a	67.5 a	53.8 a	2.5
WAC79 4 fl oz + Protect T/O 5 oz	14	31.3 ab	56.5 a-c	46.5 a-c	3.0
WAC79 2 fl oz + 3336 F 4 fl oz	14	27.5 a-d	41.5 c-f	40.3 b-e	3.8
WAC79 3 fl oz + 3336 F 4 fl oz	14	31.3 ab	47.5 b-e	42.5 a-e	3.3
WAC79 4 fl oz + 3336 F 4 fl oz	14	32.5 a	56.3 a-c	50.0 ab	2.5
Rubigan AS 1.5 fl oz	21	12.5 e-h	26.3 f-k	23.9 f-i	5.0
Rubigan AS 1.5 fl oz + Heritage 0.3 oz	21	10.6 e-h	35.0 d-h	36.3 c-f	3.8
Rubigan AS 1.5 fl oz	28	4.8 f-h	21.3 g-m	20.0 g-k	5.3
Rubigan AS 1.5 fl oz + Heritage 0.4 oz	28	8.8 e-h	28.8 f-j	23.8 f-i	5.0
Pentathlon DF 3 oz	7	37.5 a	66.3 a	53.8 a	2.3
Pentathlon DF 4 oz	7	31.3 ab	50.0 a-d	46.3 a-c	3.0
Eagle 40 WSP 0.6 oz	14	0.1 h	0.3 p	0.6 m	7.5
Eagle 40 WSP 1.2 oz	28	0.3 h	0.0 p	0.2 m	8.0
FORE Rainshield 8 oz	14	16.8 c-f	26.3f-k	36.3 d-f	3.5
FORE 8 oz	14	18.8 b-e	50.0 a-d	48.8 a-c	2.8
Eagle G (XF-00023) 4 oz	14	0.2 h	3.8 m-p	0.3 m	8.0

Eagle G (XF-00024) 2.5 oz	14	0.2 h	0.4 p	0.2 m	8.8
Eagle G (XF-00023) 8 oz	28	0.7 h	0.6 p	1.3 m	7.3
Eagle G (XF-00024) 5 oz	28	0.1 h	0.2 p	0.1 m	8.5
Eagle/Daconil 3.5 oz	14	0.0 h	0.0 p	0.0 m	7.8
Eagle/Daconil 7 oz	28	0.8 h	0.0 p	0.0 m	7.3
S7511 32 oz	14	5.5 a-c	12.8 i-p	12.6 i-m	6.5
S7511 64.1 oz	14	2.2 gh	3.0 n-p	1.9 lm	7.5
S7511 128.2 oz	14	0.0 h	0.0 p	0.0 m	7.8
S3026 21.1 oz	14	4.8 f-h	10.5 k-p	10.5 j-m	6.3
S3026 42.3 oz	14	0.1 h	0.2 p	0.2 m	7.5
S3026 84.7 oz	14	0.0 h	0.0 p	0.0 m	7.8
S7221 0.31 oz	14	0.1 h	1.0 op	0.5 m	7.5
S7221 0.62 oz	14	0.0 h	0.1 p	0.3 m	7.5
S7221 1.25 oz	14	0.0 h	0.0 p	0.0 m	7.3
S9427 0.25 oz	14	0.0 h	0.1 p	0.2 m	7.5
S9427 0.5 oz	14	0.1 h	0.0 p	0.0 m	7.8
S9427 1 oz	14	0.0 h	0.0 p	0.0 m	7.8
AND710-00 32 oz	14	5.3 f-h	11.3 j-p	10.5 j-m	6.3
AND711-00 64.1 oz	14	0.4 h	1.1 op	1.5 lm	7.5
AND712-00 128.2 oz	14	0.0 h	0.0 p	0.0 m	8.0
AND713-00 21.1 oz	14	2.1 gh	4.0 m-p	3.6 lm	7.0
AND714-00 42.3 oz	14	0.1 h	0.1 p	0.1 m	7.8
AND715-00 84.7 oz	14	0.0 h	0.0 p	0.0 m	6.5
Dac. Ultrex 3.2 oz	14	1.4 gh	18.8 h-o	21.3 g-j	6.0
Lynx 45 WP 0.55	14	0.0 h	0.0 p	0.0 m	7.3
Lynx 45 WP .0278 + Dac. Ultrex 1.82	14	0.0 h	0.0 p	0.2 m	7.3
Control	--	33.8 a	55.0 a-c	47.5 a-c	2.5
Chipco 26GT 4 oz	14	0.1 h	1.5 op	2.6 lm	7.0

<sup>a</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).

<sup>b</sup> Quality rating scale: 10 = best, 0 = worst, 7 = acceptable.

Melting Out (*Dreschlera poae*)

Study was set up on a Kenblue Kentucky bluegrass at Hancock Turfgrass Research Center, E. Lansing, MI. The study consisted of 4 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 2 using a CO<sub>2</sub> backpack sprayer at 34 PSI with two 8002E flat fan nozzles. Subsequent applications for 14-day treatments were made on May 17, May 30, June 13, and June 27 and for 21-day treatments on May 23 and June 13. Treatments on a 35-day preventive schedule were reapplied on June 9. Curative treatments were applied initially on June 3. The spray volume used was 1 gallon per 1000 ft<sup>2</sup> unless otherwise indicated in the data table. Fertilizer was applied as follows: June 1 (1/4#N), June 10 (1/8#N), June 19 (1/8#N), and June 27 (1/8#N). Plots were rated on a 0-10 scale where 0= no disease and 10=100% leaves infected (see Table 3.) Data were analyzed with ANOVA and means separated with LSD (p=0.05). No phytotoxicity was observed in this study this season.

As the data in Table 3 indicate, most treatments gave statistically significant control of melting out through the June 29 rating. Disease pressure was relatively light this year as we experienced a warm, dry spring.

Treatment Rate/1000 sq ft	Interval (Days)	31-May <sup>a</sup>	20-Jun <sup>a</sup>	29-Jun <sup>a</sup>
TADS 12529 (70 WG) 8.5 g	21	2.25 b-e	2 ef	1.75 f
Chipco Triton (1.67SC) 1 fl oz	21	1.75 de	2.25 d-f	2 ef
TADS 12529 (70 WG) 4.25 g	21	2 c-e	2.25 d-f	2 ef
Chipco Triton (1.67SC) 0.5 fl oz	21	2.25 b-e	2 ef	2.25 d-f
Compass 50 WG 0.1 oz <sup>b</sup>	1 app. only	2.5 b-d	3.5 ab	2.5 c-e
Banner Maxx 2 fl oz	14	1.75 de	1.75 f	2.75 cd
Chipco 26GT 4 fl oz	14	2.5 b-d	2.5 c-f	2.75 cd
Compass 50 WG 0.15 oz <sup>b</sup>	1 app. only	2.5 b-d	2.75 b-e	3 bc
Daconil Ultrex 3.8 oz	14	2 c-e	2.75 b-e	3 bc
Control	--	3.75 a	3.75 a	3.5 ab

<sup>a</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).

<sup>b</sup> Spray volume was 2 gal/1000 ft<sup>2</sup>.

<sup>c</sup> Spray volume was 3 gal/1000 ft<sup>2</sup>.

## Summer Stress Syndrome in Bentgrass

This trial was conducted on a Penncross creeping bentgrass green at the Hancock Turfgrass Research Center, E. Lansing, MI. The plot area was mowed at 0.125" and 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 CO<sub>2</sub> backpack sprayer and a single 8002E tee-jet flat fan nozzle. Initial application of treatments 1–13 and 15–25 was on 26 May, treatment 14 on 9 June, treatment 27 on 21 July, and treatment 26 on 27 July. Re-applications were made on intervals as indicated in the tables below. Treatments on a 7-day interval were applied 13 times, 14-day interval 7 times, 21-day interval twice, and 28-day interval 4 times. For specific application dates, see table 4. A ½ # nitrogen 1000 ft<sup>-2</sup> application was made on 30 May with subsequent fertilizer applications of ¼ # nitrogen ft<sup>-2</sup> on 13 June, 27 June, 11 July, 24 July, and 9 August. Due to the varied fungicide combinations tested in this study, no additional chemical applications were made to control dollar spot but instead, a 2 oz Chipco 26GT treatment #26 was added on 26 July to serve as a control without turf loss from 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 weather we experienced this summer was not typical with regard to stress for growing grass as we had plenty of rain and cool temperatures that did not reach 90°F. Many treatments provided turf quality that was superior to our untreated control and the control with Chipco 26GT to manage dollar spot later in the season. Several treatments provided good season-long turf quality. Three 14-day treatments, including Signature at the 4 oz rate in combination with Chipco 26GT (4 oz) and Daconil Ultrex (3.8 and 3.5 oz) and another combination treatment with Heritage (0.4 oz) at 28 days + Daconil Ultrex (3.2 oz) + Aliette (4 oz) on a 14-day schedule, were among those with the best overall quality for the duration of the study. Overall turf quality was affected by a dollar spot outbreak later in the season since it resulted in lower density and overall quality. Fore Rainshield + Signature provided excellent quality throughout most of the study and then received lower ratings in August due to thinning from dollar spot infestation. By the last rating date, the WAC 3 and 4 fl oz combinations with Daconil Ultrex provided significantly better quality than the Daconil Ultrex alone at the same rate. Similarly, the 1.5 oz rate of Daconil on a 7-day interval, in combination with MKP, provided similar quality as Daconil Ultrex (3.8 oz) + Signature (4 oz) at 14 days by the end of August, as did MacroSorb + Daconil Ultrex (3.8 oz), which was initiated later in the season than most treatments.



**Table 4. Mean quality ratings (LSD, p=0.5%) for summer bentgrass decline.**

	Treatment Rate/1000ft <sup>2</sup>	Interval (Days)	27-Jun	12-Jul	25-Jul	8-Aug	25-Aug
1	Daconil Ultrex 3.8 oz	14	7.8 <sup>a</sup> b-d	7.8 c-f	7.3 cd	7.3 d-f	7.3 b-e
2	Aliette Signature 4 oz	14	8.3 ab	8.3 a-d	6.8 d-f	6.8 f-h	6.3 f-h
3	Daconil Ultrex 3.8 oz + Aliette Signature 4 oz	14	8.3 ab	8.8 ab	8.0 ab	8.3 ab	8.0 ab
4	Daconil Ultrex 1.9 oz	14	7.5 b-e	7.3 e-g	7.0 de	7.0 e-g	7.0 c-f
5	Aliette Signature 2 oz	14	7.0 c-f	7.5 d-g	7.0 de	6.8 f-h	6.5 e-h
6	Daconil Ultrex 1.9 oz + Aliette Signature 2 oz	14	8.3 ab	8.5 a-c	7.8 bc	7.5 c-e	7.3 b-e
7	Aliette Signature 4 oz + Chipco 26GT 4 fl oz	14	8.5 ab	8.3 a-d	7.8 bc	8.0 bc	8.0 ab
8	Fore Rainshield 8 oz + Fosphite 8 fl oz	14	7.5 b-e	7.3 e-g	6.3 fg	7.0 e-g	6.8 d-g
9	Fore Rainshield WSP 8 oz + Aliette Sig. 4 oz	14	9.0 a	9.0 a	8.5 a	7.0 e-g	7.0 c-f
10	Daconil Ultrex 3.5 oz + Aliette Signature 4 oz	14	8.5ab	9.0 a	8.3 ab	8.0 bc	8.3 a
11	Fosphite 8 fl oz	14	6.8 d-f	6.8 g-i	6.5 e-g	6.3 hi	6.0 gh
12	Heritage 0.4 oz + Daconil Ultrex 3.2 oz + Aliette Signature 4 oz	28 14	9.0 a	9.0 a	8.3 ab	8.8 a	8.3 a
13	Heritage 0.4 oz + Daconil Ultrex 3.2 oz	28 14	8.0 a-c	8.0 b-e	7.3 cd	7.3 d-f	7.5 a-d
14	Macro Sorb 2 oz	14	6.8 d-f	7.0 f-h	6.3 fg	6.0 i	6.0 gh
15	WAC79 2 fl oz + Dac Ultrex 3.8 oz	14	7.8 b-d	8.0 b-e	6.8 d-f	7.8 b-d	7.0 c-f
16	WAC79 3 fl oz + Dac Ultrex 3.8 oz	14	8.0 a-c	7.8 c-f	6.8 d-f	7.0 e-g	7.3 b-e
17	WAC79 4 fl oz + Dac Ultrex 3.8 oz	14	7.8 b-d	8.3 a-d	7.0 de	6.8 f-h	7.8 a-c
18	WAC79 2 fl oz + Protect T/O 5 oz	14	6.8 d-f	7.0 f-h	6.5 e-g	6.5 g-i	6.3 f-h
19	WAC79 3 fl oz + Protect T/O 5 oz	14	6.8 d-f	7.0 f-h	6.5 e-g	6.8 f-h	6.3 f-h
20	WAC79 4 fl oz + Protect T/O 5 oz	14	6.5 ef	6.8 g-i	6.5 e-g	6.8 f-h	6.3 f-h
21	WAC79 2 fl oz + 3336 WP 4 oz	14	6.8 d-f	7.3 e-g	7.0 de	7.0 e-g	6.5 e-h
22	WAC79 3 fl oz + 3336 WP 4 oz	14	6.8 d-f	7.0 f-h	6.8 d-f	7.0 e-g	6.3 f-h
23	WAC79 4 fl oz + 3336 WP 4 oz	14	6.3 f	6.8 g-i	6.5 e-g	7.0 e-g	6.8 d-g
24	MKP 5# / acre	7	6.0 f	5.8 j	6.3 fg	6.0 i	5.8 h
25	Daconil Ultrex 1.5 oz + MKP 5# / acre	7	7.0 c-f	6.3 h-j	6.3 fg	6.5 g-i	7.8 a-c
26	Chipco 26GT 2 oz (Control)	21	NA	6.8 g-i	6.0 g	6.0 i	6.3 f-h
27	Macro Sorb 2 oz + Daconil Ultrex 3.8 oz	14	NA	7.0 f-h	6.3 fg	6.8 f-h	7.5 a-d
28	Untreated Control	--	6.8 d-f	6.0 ij	6.0 g	6.3 hi	5.8 h

<sup>a</sup>Treatments means followed by the same letter do not significantly differ (LSD, p=0.05).

## Summer Stress Syndrome in Annual Bluegrass

This trial was conducted on a *Poa annua* fairway at the Hancock Turfgrass Research Center, E. 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 CO<sub>2</sub> backpack sprayer and a single 8002E tee-jet flat fan nozzle. Initial application of treatments 1-13 and 15-25 was on 26 May, treatment 14 on 9 June, treatment 27 on 21 July, and treatment 26 on 27 July. Re-applications were made on intervals as indicated in the tables below. Treatments on a 7-day interval were applied 13 times, 14-day interval 7 times, 21-day interval twice, and 28-day interval 4 times. For specific application dates, see table 5. A ½ # nitrogen 1000 ft<sup>-2</sup> application was made on 30 May with subsequent fertilizer applications of ¼ # nitrogen 1000 ft<sup>-2</sup> on 13 June, 27 June, 11 July, 24 July, and 9 August. Due to the varied fungicide combinations tested in this study, no additional chemical applications were made to control dollar spot but instead, a 2 oz Chipco 26GT treatment was added on 26 July to serve as a control without turf loss from 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).

**Table 5. Mean quality ratings for summer decline in annual bluegrass.**

	Treatment Rate/1000ft <sup>2</sup>	Interval (Days)	27-Jun	12-Jul	25-Jul	8-Aug	25-Aug
1	Daconil Ultrex 3.8 oz	14	8.0 <sup>a</sup> b-e	8.0 b-e	8.0 bc	7.5 c-e	6.8 de
2	Aliette Signature 4 oz	14	7.5 d-f	6.0 h-j	6.0 ij	5.5 k-m	6.3 e-g
3	Daconil Ultrex 3.8 oz + Aliette Signature 4 oz	14	9.0 a	8.8 ab	9.0 a	8.5 ab	7.5 bc
4	Daconil Ultrex 1.9 oz	14	7.8 c-f	7.8 c-e	7.3 d-f	7.0 e-g	6.5 d-f
5	Aliette Signature 2 oz	14	7.8 c-f	6.0 h-j	6.5 g-i	5.8 j-l	6.0 fg
6	Daconil Ultrex 1.9 oz + Aliette Signature 2 oz	14	9.0 a	7.8 c-e	7.5 c-e	7.3 d-f	6.8 de
7	Aliette Signature 4 oz + Chipco 26GT 4 fl oz	14	8.8 ab	9.0 a	8.3 b	8.8 a	8.3 a
8	Fore Rainshield 8 oz + Fosphite 8 fl oz	14	8.5 a-c	7.5 d-f	7.0 e-g	6.0 i-k	6.0 fg
9	Fore Rainshield WSP 8 oz + Aliette Sig. 4 oz	14	8.5 a-c	8.0 b-e	7.3 d-f	6.8 f-h	6.3 e-g
10	Daconil Ultrex 3.5 oz + Aliette Signature 4 oz	14	8.1 a-e	8.5 a-c	9.0 a	8.0 bc	6.8 de
11	Fosphite 8 fl oz	14	8.0 b-e	7.3 e-g	7.0 e-g	6.0 i-k	6.3 e-g
12	Heritage 0.4 oz + Daconil Ultrex 3.2 oz + Aliette Signature 4 oz	28 14	9.0 a	8.8 ab	9.0 a	8.8 a	7.8 ab
13	Heritage 0.4 oz + Daconil Ultrex 3.2 oz	28 14	9.0 a	9.0 a	9.0 a	8.0 bc	7.0 cd
14	Macro Sorb 2 oz	14	6.5 g	6.0 h-j	6.5 g-i	5.8 j-l	6.3 e-g
15	WAC79 2 fl oz + Dac Ultrex 3.8 oz	14	8.8 ab	8.8 ab	8.3 b	7.5 c-e	7.0 cd
16	WAC79 3 fl oz + Dac Ultrex 3.8 oz	14	8.0 b-e	8.3 a-d	7.8 b-d	7.5 c-e	6.8 de
17	WAC79 4 fl oz + Dac Ultrex 3.8 oz	14	8.0 b-e	8.3 a-d	7.8 b-d	7.8 cd	7.0 cd
18	WAC79 2 fl oz + Protect T/O 5 oz	14	7.3 e-g	6.3 hi	6.5 g-i	5.5 k-m	6.0 fg
19	WAC79 3 fl oz + Protect T/O 5 oz	14	7.3 e-g	6.3 hi	6.5 g-i	6.0 i-k	6.0 fg
20	WAC79 4 fl oz + Protect T/O 5 oz	14	8.3 a-d	6.5 gh	6.3 h-j	6.3 h-j	6.0 fg
21	WAC79 2 fl oz + 3336 WP 4 oz	14	7.5 d-f	6.0 h-j	7.0 e-g	6.0 i-k	5.8 g
22	WAC79 3 fl oz + 3336 WP 4 oz	14	7.6 c-f	6.8 f-h	7.0 e-g	6.5 g-i	6.3 e-g
23	WAC79 4 fl oz + 3336 WP 4 oz	14	8.0 b-e	6.3 hi	6.8 f-h	6.0 i-k	5.8 g
24	MKP 5# / acre	7	7.0 fg	5.5 ij	6.3 h-j	5.0 m	6.5 d-f
25	Daconil Ultrex 1.5 oz + MKP 5# / acre	7	8.8 ab	9.0 a	8.0 bc	7.8 cd	8.0 ab
26	Chipco 26GT 2 oz (Control) <sup>b</sup>	21	NA	6.8 f-h	6.5 g-i	7.0 e-g	6.3 e-g
27	MacroSorb 2 oz + Daconil Ultrex 3.8 oz	14	NA	6.0 h-j	6.8 f-h	7.0 e-g	7.0 cd
28	Untreated Control	--	8.0 b-e	5.3 j	5.8 j	5.3 lm	6.0 fg

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

<sup>b</sup>Chipco 26GT applied on 26 July and was added as a new treatment at that time.



Brown Patch (*Rhizoctonia solani*)

This study was set up on a newly renovated ryegrass plot area at the Hancock Turfgrass Research Center, E. Lansing, MI. The study was a randomized complete block design with 4 replicates of each treatment. Plots measured 2' x 6' with 1' alleys. Treatments were applied using a CO<sub>2</sub> backpack sprayer at 48 GPA and 34 PSI with a single 8002E tee jet flat fan nozzle. Subdue Maxx was applied at 1 oz/1000 ft<sup>2</sup> every 14 days to prevent a *Pythium* blight outbreak. The study area was inoculated (7/9, 7/17, 7/25) 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: 6/21 (1/2#N), 6/30 (1/2#N), 7/6 (3/4#N), 7/17 (1/2#N). Plots were rated for percent area blighted by brown patch (see Table 6.) Data were analyzed using ANOVA and means separated with LSD (p=0.05). A quality rating was taken using a 1-10 scale, where 1= poor and 10= excellent (see Table 6.)

A second study was set up on a Penncross creeping bentgrass green mowed at 0.125". The study set up was the same as above except for the fertility. Fertility for the green study was as follows: 6/21 (1/4#N), 7/6 (1/2#N), 7/17 (1/4#N).

Due to a rather mild summer, conditions were not ideal for brown patch development in our area. However, with the covering of the plots with the vinyl tarp, disease did develop. On the green, the covering also caused some slight etiolation which resulted in scalp when the plots were mowed. By the time that brown patch became severe and uniform enough to rate, scalp made the plot area unrateable so no reliable data were collected from the green study. On the taller cut ryegrass, however, data are presented from 2 rating dates. On the 7/20 date (Table 6), there are no significant differences between the control and any of the treatments, but by the 7/31 rating, most treatments provided significant control of brown patch (Table 6). Mean quality values ranged from 7.5 – 5.3 (see Table 6.)

<b>Table 6. Brown Patch (Ryegrass)</b>				
<b>Rating Scale: % area blighted by <i>R. solani</i></b>				
<b>Quality Rating Scale: 1-10, 1= poor, 10= excellent</b>				
<b>Treatment Rate/1000 ft<sup>2</sup></b>	<b>Interval (Days<sup>a</sup>)</b>	<b>Mean 7/20 (LSD<sup>b</sup>)</b>	<b>Mean 7/31 (LSD)</b>	<b>Mean Quality 7/31</b>
Heritage 0.2 oz	14	0.3 a	0.0 a	7.5
Heritage 0.4 oz	28	0.3 a	0.0 a	6.8
Compass 0.15 oz + Banner Maxx 1 fl oz	14	0.4 a	0.0 a	7.5
Chipco 26GT 4 oz	14	2.5 ab	0.4 a	6.5
Prostar 2.2 oz	14	2.8 ab	0.0 a	6.3
Compass 0.15 oz	14	2.9 ab	0.0 a	7.0
WAC79 2 fl oz + Protect T/O 5 oz	14	3.3 ab	0.9 ab	6.3
WAC79 2 fl oz + Dac. Ultrex 3.8 oz	14	6.3 a-c	0.1 a	7.0
Daconil Ultrex 3.8 oz	14	6.5 a-c	0.0 a	7.0
WAC79 4 fl oz + Dac. Ultrex 3.8 oz	14	7.3 a-c	2.5 ab	6.8
WAC79 4 fl oz + Protect T/O 5 oz	14	7.5 a-c	2.5 ab	6.5
WAC79 3 fl oz + Dac. Ultrex 3.8 oz	14	8.8 a-d	0.0 a	6.8
Control	--	8.8 a-d	17.6 d	5.8
WAC79 2 fl oz + 3336 WP 4 oz	14	13.5 b-d	13.8 cd	5.3
WAC79 3 fl oz + 3336 WP 4 oz	14	14.0 b-d	7.8 a-c	5.5
WAC79 4 fl oz + 3336 WP 4 oz	14	16.5 cd	8.9 bc	6.0
WAC79 3 fl oz + Protect T/O 5 oz	14	21.0 d	0.0 a	6.5

<sup>a</sup> 14-day treatments were applied on 6/28, 7/12, 7/25 and 8/4. 28 day treatments were applied on 6/28 and 7/25.

<sup>b</sup> Means followed by the same letter do not differ significantly (LSD, p=0.05).

Red Thread (*Laetisaria fuciformis*)

This study was set up on a ryegrass fairway height turf at Hancock Turfgrass Research Center, E. Lansing, MI. The study consisted of 4 replicates of each treatment set up in a randomized complete block design with plots measuring 6' x 6' with 1' alleys. Treatments were applied curatively using a CO<sub>2</sub> backpack sprayer at 48 GPA and 34 PSI with two 8002E flat fan nozzles. A pre-treatment rating was taken on 5/31/00 (Table 2). Treatments were applied for the first time on 5/31/00 after the rating was taken. The 14-day treatments were reapplied on 6/14, 6/28, 7/12, and 7/26, and the 21-day treatments were reapplied on 6/22 and 7/12. The two Compass treatments that received only one application were sprayed on 5/31/00. Fertilizer was applied as follows: 6/27 (1/8#N), 6/30 (1/4#N), 7/20 (1/4#N), and 8/2 (1/8#N). Plots were rated for % area infected. Percent recovery was calculated based on the initial 5/31/00 ratings, and these means are presented in Table 7. Data were analyzed with ANOVA and means separated with LSD (p=0.05) (see Table 7).

All of the treatments tested in this study provided significant red thread management compared to the untreated control at some point during this trial. Chipco 26GT, both Chipco Triton treatments, and both TADS treatments provided greater than 90% recovery by the end of the study.

**Table 7. Mean % improvement in red thread (difference between 5/31 initial rating and rating date listed below.)**

Treatment Rate/1000 ft <sup>2</sup>	Interval (Days)	Mean <sup>a</sup> 6/8	Mean 6/23	Mean 7/6	Mean 8/2
Chipco 26GT 4.0 fl oz	14	27.1a	75.4 a	97.5 a	100 a
Chipco Triton 1.0 fl oz	21	-10 a	50.4 a	97.5 a	100 a
TADS 12529 8.5g	21	-42.5 ab	17.9 a	91.6 a	100 a
Chipco Triton 0.5 fl oz	21	4.2 a	54.2 a	83.3 a	100 a
TADS 12529 4.25g	21	-10.7a	33.3 a	82.4 a	91.7 a
Banner Maxx 2.0 fl oz	21	-17.5 ab	10.0 a	48.4 a	47.1 a
Compass 50 WG 0.1 oz	1 app	33.3 a	36.7 a	16.7 a	9.2 a
Compass 50 WG 0.15 oz	1 app	19.6 a	66.8 a	-27.9 a	-50 ab
Control	--	-97.5 b	-122.5 b	-385 b	-265 b

<sup>a</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).

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 preventively with a CO<sub>2</sub> Backpack sprayer at 34 PSI and 48 GPA. Treatments were initiated on 6/6/00 when we reached 75°F at a 2" soil depth. The exception was the TSC treatment which was initiated on 5/17/00, along with the Nature Safe treatment. The 14-day treatments were re-applied on 6/19, 7/5, 7/17, 8/3 and 8/14. The 21-day treatments were re-applied on 6/26, 7/17, and 8/10. The 28-day treatments were re-applied on 7/5 and 8/3. The 30-day treatment was re-applied on 6/13, 7/13, and 8/10. Fertility was maintained at ¼#N/1000 ft<sup>2</sup>/month (except treatments #7 and #19 which were not fertilized.) Data represent percent plot area diseased on Sept 5, 2000, when disease development peaked.

As the data in Table 8 indicate, summer patch disease pressure was light this year due to the cool, wet summer we experienced. Daytime temperatures never exceeded 90°F, and nighttime temperatures generally cooled to 65°F or lower. Under these conditions, diseases like anthracnose and summer patch, which require prolonged heat/drought stress, generally are not severe. Statistical analysis of the data, however, indicates that Compass, Heritage and Banner Maxx gave significant control of this low-level disease pressure compared to the untreated control. Treatment separation outside of the control was not well-defined because disease pressure was low.

**Table 8. Summer Patch Data, Dearborn CC, Dearborn, MI**  
Rating Date: 9/5/00

Treatment Rate/1000 sq ft	Interval (Days)	R1	R2	R3	R4	AVG	LSD
Heritage 0.4 oz	28 (2 apps)	2	0	0	1	0.8	D
Nature Safe 1/2#	30 (2 apps Apr)	2	2	2	0	1.5	CD
Macro Sorb 2 oz	14	1	2	2	2	1.8	BCD
Heritage 0.1 oz	14	0	0	0	1	0.3	D
Macro Sorb 2 oz + Heritage 0.1 oz	14	0	0	0	0	0.0	D
Compass 0.2 oz	21 (4 apps)	0	1	0	0	0.3	D
Compass 0.25 oz	28 (3 apps)	1	0	1	1	0.8	D
Compass 0.2 oz + Banner Maxx 2 fl oz	21 (4 apps)	0	5	1	0	1.5	CD
Banner Maxx 1 fl oz alternated with Compass 0.25 oz	14 (2 apps) 28 (3 apps)	3	0	1	2	1.5	CD
Banner Maxx 4 fl oz alternated with Compass 0.25 oz	28 (1 app) 21 (3 apps)	5	0	2	0	1.8	BCD
Banner Maxx 4 fl oz	75 + 28(2 apps)	1	2	1	5	2.3	BCD
Control	--	5	5	10	3	5.8	AB
TSC (15-3-15) 7.6 fl oz	14	3	25	1	7	9.0	A

<sup>a</sup> Means followed by the same letter are not significantly different (LSD, p=0.05).

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 4 replicate 2' x 6' plots laid out in a random block design. Treatments were applied initially on May 5, 2000 using a single nozzle CO<sub>2</sub> backpack sprayer at 30 PSI and 48 GPA. Treatments were reapplied on a 7 and 14 day interval as cited in Table 9. Data were analyzed using ANOVA and means separated with LSD (p=0.05).

As the table indicates, weekly ratings show increasing disease pressure in the control plots throughout the study duration. Statistical analysis of treatment ratings indicates that every treatment gave significant control of *Microdochium* patch to the extent of promoting virtually full recovery by the June 9 rating. No phytotoxicity was observed during the course of the study.

**Table 9. Microdochium patch, Hancock Turfgrass Research Center**  
Rating Scale = Mean % recovery from initial rating

Treatment Rate/1000 sq ft	Interval (Days)	12-May <sup>a</sup>	19-May	30-May	2-Jun	9-Jun
Pentathlon DF 3 oz	7	-22 a	5 a	73 a	65 a	98 a
Pentathlon DF 4 oz	7	-20 a	11 a	71 a	85 a	98 a
Concorde SST 720L 2.125 fl oz	7	-25 a	-17 a	77 a	80 a	98 a
Concorde SST 720L 3.5 fl oz	7	-30 a	-17 a	50 a	75 a	99 a
Chipco 26GT 4 fl oz	14	-35 a	8 a	66 a	83 a	97 a
Control	--	-71 b	-80 b	-95 b	-81b	-83 b

<sup>a</sup> Treatment means followed by the same letter are not significantly different from each other at the 5% level (LSD).



### Take All Patch (*Gaeumannomyces graminis*)

Take All Patch (*Gaeumannomyces graminis*) studies were conducted preventively and curatively this year. The preventive study was established on the Lynx Golf Club in Otsego, MI on a bentgrass fairway where take-all patch has been observed in recent years. Unfortunately, no active disease was observed on this fairway this year, so no data was available. A curative study was established on an actively diseased bentgrass fairway at the Bloomfield Hills Golf Club in Bloomfield Hills, MI. The study was set out in 4 replications of a randomized complete block design utilizing 6' x 9' plots, each of which displayed one or more take-all patches. A pre-treatment disease rating was taken on 5/31, and initial treatments were applied on 6/6. Applications were made with a small plot, CO<sub>2</sub> sprayer with two flat fan nozzles at 30 PSI and 48 GPA. Treatments were re-applied at the interval cited in the data table (Table 10) through 7/10, when the last disease rating was taken. Fertility was applied on 6/6 (1/4 #N/1000 ft<sup>2</sup>), on 6/19 (1/4 #N/1000 ft<sup>2</sup>), and on 6/29 (1/4 #N/1000 ft<sup>2</sup>) to promote new growth in the treated plots.

A second curative take-all patch study was established on a diseased bentgrass fairway at the Golf Club of Michigan. The study was established in 4 replicates of 6' x 9' plots in a randomized complete block design. Treatments were applied with a CO<sub>2</sub> backpack sprayer using flat-fan nozzles at 32 PSI and 100 GPA. Because disease was already present, a pre-treatment disease rating was taken prior to application of the initial treatments on Aug 8. The fertilizer treatments were pre-weighed and hand-applied. The fungicide plots were fertilized at the rate of ¼ #N/1000 ft<sup>2</sup> every 14 days throughout the course of the study, with the initial application being made on Aug 9. Fungicides and fertilizers were reapplied at intervals listed in the data table.

As the data in Table 10 indicate, by the 7/5 rating, most of the fungicide treatments were promoting a significantly faster recovery than the untreated controls were experiencing. By the 7/10 rating, all the treatments exhibited significantly better recovery than the untreated control. The recovery that was observed in the controls during the course of the study can be attributed to the low rate of fertility that was applied to the overall study. Data were analyzed using ANOVA and the LSD test (0.05).

As the data in Table 11 indicate, Heritage was very effective in curing this take-all outbreak. As we have seen in the past, somewhat elevated fertility (ammonium sulfate, sulfur-coated urea, Country Club 18-3-18) also proved efficacious in managing the disease. The failure of 3336 and Banner Maxx fungicides to control this outbreak was surprising. Fertility in the plot area was very low when the first treatments were applied and remained moderate through the end of the study. This may explain the apparent lack of efficacy we usually observe with 3336. Data were analyzed using ANOVA and the LSD test (0.05).

**Table 10. Take All Patch, Bloomfield Hills CC, Bloomfield Hills, MI**  
**Rating Scale: Mean % recovery from pre-treatment disease levels on 5/31.**

Treatment Rate/1000 sq ft	Int.	19-Jun <sup>a</sup>	26-Jun	5-Jul	10-Jul
Heritage (ICIA 5504) 18 gm/100 sq m	28	45.1 a	52.5 ab	88.6 a	93.8 a
Heritage (ICIA 5504) 12 gm/100 sq m	28	26.7 ab	39.6 a-d	82.2 a-c	93.5 a
TADS 12529 (70 WG) 4.25 g	28	31.3 ab	31.7 a-d	77.9 a-c	92.1 ab
Heritage (50WG) 0.4 oz (2 apps only)	28	49.2 a	48.3 a-c	88.8 a	91.8 ab
Heritage (ICIA 5504) 6 gm/100 sq m	28	32.5 ab	63.3 a	86.7 ab	91.7 ab
Chipco Triton (1.67SC) 1 fl oz	14	19.4 a-d	42.7 a-d	79.0 a-c	89.5 a-c
Chipco Triton (1.67SC) 0.5 fl oz	14	20.0 a-d	-7.5 e	71.8 a-d	89.5 a-c
Compass (50WG) 0.25 oz + Banner Maxx 2 fl oz	28	-5.0 cd	20.8 b-e	77.5 a-c	87.2 a-e
Chipco Triton (1.67SC) 1 fl oz	28	20.8 a-d	40.1 a-d	75.4 a-c	86.4 a-e
TADS 12529 (70 WG) 8.5 g	28	24.2 a-c	39.7 a-d	81.5 a-c	85.7 a-e
Compass (50WG) 0.20 oz + Banner Maxx 2 fl oz	28	10.0 b-d	38.0 a-d	79.3 a-c	83.8 a-e
Banner Maxx 8.1 gm ai/100 sq m	28	7.7 b-d	25.0 a-e	69.8 a-d	78.1 a-e
3336 F 6 fl oz	14	5.0 b-d	43.3 a-d	52.1 de	76.7 b-e
Compass (50WG) 0.25 oz	28	22.7 a-d	21.9 b-e	62.9 cd	73.7c-e
Chipco Triton (1.67SC) 0.5 fl oz	28	25.1 a-c	15.8 b-e	66.4 b-d	72.7 de
Banner Maxx 2 fl oz	14	-7.7 d	8.4 de	65.4 cd	71.6 e
Control	--	22.7 a-d	12.1 c-e	35.7 e	53.7 f

<sup>a</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).

<b>Table 11. Take All Patch, Golf Club of Michigan, Brighton, MI</b>		
<b>Rating Scale: Mean % recovery from pre-treatment disease levels on 8/8.</b>		
<b>Rating Date: 10/18/00</b>		
<b>Treatment and Rate/1000 ft<sup>2</sup></b>	<b>Interval (Days)</b>	<b>Mean (LSD<sup>a</sup>)</b>
Heritage (50WG) 0.4 oz (2 apps only)	28	87.9 a
Heritage (ICIA 5504) 18 gm/100 sq m	28	80.0 ab
Heritage (ICIA 5504) 12 gm/100 sq m	28	74.7 a-c
Ammonium sulfate 1/2 #N	14	69.6 a-d
Country Club 18-3-18 1/2#N	14	59.2 a-e
Heritage (ICIA 5504) 6 gm/100 sq m	28	58.8 a-e
Sulfur-coated urea 1/2#N	14	49.9 a-f
TADS 12529 (70 WG) 4.25 g/1000 sq ft	28	35.8 a-g
Chipco Triton (1.67SC) 0.5 fl oz	14	34.6 a-g
Chipco Triton (1.67SC) 0.5 fl oz	28	25.1 a-g
3336 F 6 fl oz	14	21.0 b-g
Banner Maxx 8.1 gm ai/100 sq m	28	19.7 b-g
Banner Maxx 2 fl oz	14	19.2 b-g
Chipco Triton (1.67SC) 1 fl oz	28	15.8 c-g
TADS 12529 (70 WG) 8.5 g/ 1000 sq ft	28	13.2 c-g
Chipco Triton (1.67SC) 1 fl oz	14	13.1 c-g
Compass (50WG) 0.25 oz + Banner Maxx 2 fl oz	28	10.8 c-g
Sulfur-coated urea 1/4#N	14	9.6 d-g
Ammonium sulfate 1/4 #N	14	9.5 d-g
Compass (50WG) 0.25 oz	28	-11.0 fg
Control (fertilized)	--	-14.6 g
Compass (50WG) 0.20 oz + Banner Maxx 2 fl oz	28	-19.1 g
Unfertilized control	--	-106.3 h

<sup>a</sup> Means followed by the same letter do not significantly differ (LSD, p=0.05).