

## TURFGRASS DISEASE MANAGEMENT REPORT FOR 1985-1986

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### Snow Mold Fungicide Trial - 1985-1986

The 1985-1986 snow mold fungicide studies were conducted at the Boyne Highlands Resort in Harbor Springs, MI, on irrigated Penncross creeping bentgrass fairways which were mowed at 1/2" height of cut. Treatments were applied preventively to 6' x 9' plots in three replications of a random block design on November 7, 1985. The sprayable formulations were applied with a CO<sub>2</sub> small-plot sprayer at a volume of 48 gal/acre and 30 PSI. The granular treatments were pre-weighed and applied by hand. The plots were rated for disease on April 2, 1986, immediately following snow cover melt-off.

As can be seen from the controls (Table 1), disease pressure was moderately severe this year. There was, however, a good deal of variation in disease pressure within some of the listed treatments. The standard treatments (Calo-Clor, Calo-Gran, Scotts F + F II, Daconil 2787 + Tersan 1991), however, continued to show consistently effective control of all three snow mold organisms (Typhula incarnata, Typhula ishikariensis, Fusarium nivale).

No phytotoxicity was observed.

### Kentucky Bluegrass Melting-out Fungicide Trial - 1986

The 1986 Dreschlera poae (formerly Helminthosporium vagans) fungicide trial was conducted at the Hancock Turfgrass Research Center on the MSU campus on Kenblue Kentucky bluegrass maintained at 1 1/2" height of cut. The study was set up in a random block design consisting of three replications/treatment with a plot size of 3' x 6'. All treatments were applied with a CO<sub>2</sub> small-plot sprayer at 30 PSI at a volume of 48 gal/acre.

Treatments were initiated curatively on May 2 with subsequent applications being made on 14, 21 or 28 day intervals as indicated on the data table. The plots were rated on June 13, at which time the 14 day treatments had been applied three times (5/2, 5/17, 5/30) and the 21 and 28 day treatments had been applied twice (5/2, and 5/24 or 5/30 respectively).

Disease pressure was moderate this year so the treatments were clustered in a relatively narrow range (Table 2). Most of the compounds tested, however, did give significant disease control compared to the controls.

No phytotoxicity was observed.

## Summer Patch Fungicide Studies

In Michigan, summer patch (Phialophora graminicola) is an elusive, sporadically occurring patch disease of annual bluegrass (Poa annua) greens and fairways. Many summers in Michigan are too cool and/or moist to bring on disease symptoms. We did, however, experience a moderately severe outbreak of summer patch this year, following an unusually hot 9 day period in mid-July. As soon as the disease was diagnosed, research studies were initiated on two golf course fairways, one at the Glen Gary Golf Club in Holland, Ohio and another at the Washtenaw Country Club in Ypsilanti, MI.

Treatments were applied as described on the data table as heavy soil drenches (approx. 40 gal/1,000 ft<sup>2</sup>). The granular treatments were pre-weighed, applied by hand and watered in. Initial treatments were applied to the Washtenaw study on July 30 and to the Glen Gary study on August 11 with treatments being re-applied on Sept. 2 (Glen Gary 21 day treatments), on August 14 (Washtenaw 14 day treatments) and on August 29 (Washtenaw 14, 21, 28 day treatments) when symptoms were abating.

Disease levels in the control plots in the Washtenaw County Club plot area abated gradually from the date of initial treatment application, so no data was available. This study was larger than the Glen Gary study and it contained most of our experimental and contract research fungicides, as well as many standards.

Disease levels in the Glen Gary Golf Club plot area persisted for approximately 4 weeks, during which time significant differences developed between many treatments and the controls. The symptom area was large enough to accommodate only standard fungicides and fertilizer treatments, so no experimentals were included. By the rating date (9/8/86), all 21 day treatments had been applied twice and the 30 day treatments had been applied once (Table 3).

Data from 1983 (most recent severe outbreak of summer patch in Michigan) indicated that the benzimidazole fungicides (Tersan 1991, Fungo 50, Cleary 3336) were effective when drenched into the thatch at high rates. Bayleton was also effective in our 1983 trials although it seemed to be slower-acting. Chipco 26019 appeared to be ineffective. These trends were also observed this year, with Tersan 1991 giving the best control with the other benzimidazoles close behind. Bayleton seemed to be somewhat less effective. However, in view of our 1983 experience, it is likely that Bayleton would have been more effective if disease pressure had persisted for a longer period.

It should be noted that the heavy sulfur application (one app. at 5 pts/1000 ft<sup>2</sup>) created a stark, nitrogen-like response with the annual bluegrass becoming dark green and surging in growth. The cause of this phenomenon is unknown, but further work is called for in future years. The annual bluegrass response to sulfur at the lower rate (1 pt/1000 ft<sup>2</sup>) was barely noticeable.

No phytotoxicity was noted.

## Anthracnose Fungicide Studies - 1986

Two anthracnose (Colletotrichum graminicola) fungicide studies were established this year, one at the Borroughs Farms Golf Course in Brighton, Michigan and another at the Glen Gary Golf Club in Holland, Ohio. Both studies were set up on moderately fertilized, irrigated annual bluegrass (Poa annua L.) fairways in three replications of a random block design with a 6' x 9' plot size. All applications were made with a CO<sub>2</sub> small-plot sprayer at 30 PSI and 48 gal/acre. The fairways were mowed regularly at 1/2" height of cut.

Initial applications were made preventively on July 7 (Glen Gary Golf Club) and July 10 (Borroughs Farms Golf Course). Both of these locations have experienced significant anthracnose pressure in past years. Subsequent applications were made at the intervals indicated on the data table. When the disease rating was taken on the Glen Gary study (August 28), the 10 day treatments had been applied five times (7/7, 7/17, 7/28, 8/7, 8/15), the 14 day treatments had been applied four times (7/7, 7/21, 8/4, 8/20), and the 21 day treatments had been applied three times (7/7, 7/28, 8/20) (Table 4). The same application's were made on the Borroughs Farms location, unfortunately, disease pressure never developed on this site and no data was collected.

During normal golf course maintenance operations, part of the test area at the Glen Gary Golf Club (Rep. I) was oversprayed with Tersan 1991. This application distorted the data by controlling most of the disease in replicate 1. For this reason, we decided to present the data without statistical analysis since the analysis would be based on only two replications.

Mild phytotoxicity was observed in one treatment as noted on the data table.

### Emerald Creeping Bentgrass Dollar Spot Fungicide Study - 1986

The 1986 dollar spot (Moellerodiscus sp., Lanzia sp.) fungicide studies were conducted on a moderately fertilized, irrigated Emerald creeping bentgrass green at the Hancock Turfgrass Research Center on the MSU campus. Treatments were applied preventively in three replications of a random block design (3' x 6' plots) using a CO<sub>2</sub> small-plot sprayer operating at a volume of 48 gal/acre and a pressure of 30 PSI.

Treatments were initiated on August 13. By the time the rating was taken (Oct. 3), the 10 day treatments had been applied 5 times (8/13, 8/21, 9/3, 9/15, 9/22), the 14 day treatments had been applied 4 times (8/13, 8/28, 9/9, 9/24), and the 21 day treatments had been applied 3 times (8/13, 9/3, 9/24) (Table 5).

The weather during the 5 week period from Aug. 25 - Sept. 30 was extraordinarily wet and cool. It rained virtually daily during September. This caused disease pressure to abate until late September when temperatures returned to normal and disease pressure developed

rapidly. The constant rainfall caused the plots treated with urea to grow more rapidly than normal, possibly exposing unprotected plant tissue to disease pressure. The other fungicide compounds performed as expected with the exception of the benzimidazoles (Tersan 1991, Fungo 50, Cleary 3336) which failed to control the disease. Laboratory analysis of the dollar spot strains in this plot area indicated a high level of benzimidazole resistance.

Two experimental fungicides showed some phytotoxic effects in the study this year. These effects are explained on the accompanying data tables.

#### Fermenta Plant Protection Sulfur - Daconil 2787 Disease Studies - 1986

Three studies were established at the Hancock Turfgrass Research Center this summer with the goal of determining the effect of sulfur and Daconil 2787 FL on various turfgrass diseases. In order to screen these materials against the broadest possible disease range, one study was established on Emerald creeping bentgrass, one was established on annual bluegrass (Poa annua) and a third study was placed on perennial ryegrass. Treatments were applied on a 14 day interval using a CO<sub>2</sub> small-plot sprayer which operated at 30 PSI with a volume of 48 gal per acre. All studies were laid out in three replications of a random block design.

##### Emerald Creeping Bentgrass Study

This study was established and treated initially on June 27 on an irrigated, moderately fertilized putting green which was mowed regularly at 1/4" height of cut. Treatments were applied until Sept. 18 with a dollar spot (Moellerodiscus sp. Lanzia sp.) rating being taken on Sept. 29. By the date of the disease rating (Table 6), treatments had been applied 7 times (6/27, 7/17, 7/25, 8/7, 8/21, 9/3, 9/18). No phytotoxic or other growth effects were noted throughout the season. No other disease outbreaks were observed.

##### Annual Bluegrass Study

The study described above was also established on annual bluegrass (Poa annua) in an attempt to determine the effect of Daconil 2787 and sulfur on anthracnose (Colletotrichum graminicola) development. The area we chose was an irrigated, moderately fertilized simulated fairway location where we had hoped to experience anthracnose disease pressure. Treatments were applied initially on June 27 and were re-applied on a 14 day interval through September 18. Unfortunately, no disease pressure developed on this turf area and no data was collected. No phytotoxic or other growth effects were noted.

##### Perennial Ryegrass Study

The study was also established on a Loretta perennial ryegrass simulated lawn area in an attempt to collect brown patch (Rhizoctonia solani) and/or Pythium blight (Pythium sp) data. The area was fertilized heavily beginning in June in an effort to encourage brown patch development. Moisture levels were kept high through frequent

irrigation during periods when the weather was conducive to disease outbreak (hot and humid). The initial application was made on July 9 and treatments were re-applied on a 14 day schedule through Sept. 3 (7/9, 7/23, 8/6, 8/21).

Brown patch disease first appeared during the week of July 15. By July 23, sufficient disease was present for a rating to be taken (Table 7), although disease pressure and distribution were not optimal. Disease pressure peaked around July 23 and gradually abated. No other diseases were noted in the plot area this year, nor were any phytotoxic effects noticed.

#### Necrotic Ring Spot Fungicide Study - 1986

The 1986 necrotic ring spot fungicide study was conducted at the Countryplace Apartment Complex in Novi, MI, on an irrigated Kentucky bluegrass lawn area which was severely infected with necrotic ring spot (Leptosphaeria korrae) disease. The disease has been intermittently active for a number of years on this location.

Studies were initiated in June with subsequent applications being made on 21 and 28 day intervals through mid-October. In past years, the disease has been observed to be active in July and in October, depending on the year. This year, however, no activity was observed and the area gradually improved through the summer and fall. Therefore, no data was available from this study this year. No phytotoxic effects were observed.

#### Red Thread Fungicide Study - 1986

The 1986 red thread (Laetisaria fuciformis) fungicide study was conducted on a mixed seeding of perennial ryegrass and Kentucky bluegrass on the MSU campus. The study was initiated curatively on August 5 following a mild disease outbreak. Treatments were applied on a 14 or 21 day schedule through the end of September. Unfortunately, the cool, rainy late summer period inhibited further disease development and disease pressure gradually abated in the controls and the treated plots. No data was available. There was some mild phytotoxicity associated with the PP 523 and SAN 619 treatments which resembled the effects observed with these products in the Emerald bentgrass dollar spot study.

#### Brown Patch Fungicide Studies - 1986

The 1986 brown patch (Rhizoctonia solani) study was conducted on the MSU campus on a simulated lawn perennial ryegrass (*Lolium perenne* L.) area which was heavily fertilized and irrigated in order to promote brown patch disease development. The study was laid out in three replications of a random block design with a 6' x 9' plot size. Treatments were applied with a CO<sub>2</sub> small plot sprayer at a volume of 48 gal/acre and 30 PSI. The initial application was made curatively on July 15 with treatments being re-applied through August 27 on either 10, 14 or 21 day schedules.

Disease pressure in the plot area persisted for only a 10 day

period in July. Since treatments were applied curatively, there was insufficient time to determine which treatments were effective against the disease. Disease ratings were taken but are omitted from this report because of ununiform disease pressure in the controls and lack of disease control by such standards as Daconil 2787 and Bayleton.

Table 1. Boyne Highlands Snow Mold Fungicide Study - 1985-86

Boyne Highlands Resort, Harbor Springs, MI

Plots rated 4/2/86

Percent plot area infected with all three snow mold organisms

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>Ave. DMR<sup>1</sup></u>
Scotts F + FII	2X	0	1	1	.7 A
Calo-Clor	3 oz	2	1	5	2.7 AB
Daconil 2787 + Tersan 1991	8 fl oz + 2 oz	10	0	10	6.7 ABC
Scotts F + FII	1X	5	15	5	8.3 ABCD
Calo-Gran SN 84364	6 lbs	10	2	15	9.0 ABCD
+ Prochloraz	5 oz + 7 fl oz	15	10	2	9.0 ABCD
Rizolex WP	6.5 oz ai.	10	7	20	12.3 ABCDE
PMAS	2 fl oz	15	5	20	13.3 ABCDE
Rizolex WP	3.3 oz ai.	5	15	30	16.7 ABCDE
Rizolex FL	1.6 oz ai.	10	2	40	17.3 ABCDE
Rizolex FL	3.3 oz ai.	10	20	30	20.0 ABCDE
Rizolex FL	4.9 oz ai.	25	20	15	20.0 ABCDE
Rizolex FL	6.5 oz ai.	35	10	20	21.7 ABCDE
PMAS + Fluf	2 fl oz + 1/4 lb.N.	30	20	15	21.7 ABCDE
Rizolex WP	4.9 oz ai.	10	30	30	23.3 BCDE
PMAS + Fluf	2 fl oz + 1/2 lb.N.	25	25	30	26.7 CDEF
Rizolex WP	4.9 oz ai.	7	30	50	29.0 DEFG
PMAS + Urea	2 fl oz + 1/2 lb.N.	15	20	60	31.7 EFGH
BRC 916 + X-77	4 gm ai. + .05%	30	60	45	45.0 FGHI
SN 843664 + X-77	7 oz + .05%	40	60	50	50.0 GHIJ
BRC 916 + X-77	2 gm ai. + .05%	15	50	90	51.7 HIJK
SN 84364	4.8 oz	40	60	60	53.3 IJK
SN 84364	6 oz	55	40	75	56.7 IJKL
PP 450	2 gm ai.	60	60	60	60.0 IJKL
Control	--	70	80	50	66.7 JKL
SN 84364 + X-77	5 oz + .05%	70	50	85	68.3 KL
PP 450	4 gm ai.	60	80	80	73.3 L
NC 28410	10 fl oz	80	60	90	76.7 L

<sup>1</sup> Treatments followed by the same letter are not significantly different from each other at the 5% level of significance.

Table 2. Kentucky Bluegrass Melting-Out Fungicide Trial - 1986

Hancock Turfgrass Research Center, MSU, E. Lansing, MI  
 Disease rating scale: 1 (no disease) - 9 (90% infection)  
 Plots rated 6/13/86

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>Ave.</u>	<u>DMR<sup>1</sup></u>
Prochloraz	4.5 fl oz	14 day	2	2	2	1.7	A
Prochloraz - MN/Dac. 2787	6.9 oz	14 day	2	1	2	1.7	A
Daconil 2787	6 fl oz	14 day	1	2	2	1.7	A
Chipco 26019 (50 WP)	2 oz ai.	21 day	3	2	2	2.3	AB
Chipco 26019 (4 FL)	.5 oz ai.	21 day	4	2	1	2.3	AB
DPXH6573	.25 oz ai.	7 days apart	3	1	3	2.3	AB
Dyrene 4F	1 oz ai.	21 day	3	2	2	2.3	AB
Dyrene 4F	2 oz ai.	28 day	2	3	2	2.3	AB
Chipco 26019 (4 FL)	2 oz ai.	21 day	3	3	2	2.7	ABC
DPXH6573	2 oz ai.	21 day	3	2	3	2.7	ABC
Chipco 26019 (50WP)	.5 oz ai.	21 day	3	3	3	3.0	ABCD
DPXH6573	.5 oz ai.	21 day	4	3	2	3.0	ABCD
Prochloraz + AD-TGF	3 oz + .34 oz	14 day	3	5	1	3.0	ABCD
Dyrene 4F	1 oz ai.	14 day	3	3	3	3.0	ABCD
Prochloraz + AD-TGF	1.5 oz + .34 oz	14 day	4	3	4	3.7	BCDE
PP523	8 gm ai.	21 day	5	5	2	4.0	BCDE
DPXH6573	1 oz ai.	21 day	4	4	4	4.0	BCDE
Control	-	-	4	4	5	4.3	CDE
AD-TGF	.34 oz	14 day	6	3	5	4.7	CDE
PP523	4 gm ai.	21 day	5	6	4	5.0	E
PP523	6 gm ai.	21 day	5	4	6	5.0	E

<sup>1</sup> Treatments followed by the same letter are not significantly different from each other at the 5% level.

Table 3. Glen Gary Summer Patch Fungicide Study - 1986.

Glen Gary Golf Club, Holland, Ohio  
Plots rated 9/8/86  
Disease rating - % plot area infected

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>Ave.</u>	<u>DMR<sup>1</sup></u>
Tersan 1991	6 oz	21 day	7	5	2	4.7	A
Tersan 1991	3 oz	21 day	2	15	2	6.3	A
Cleary 3336	8 oz	21 day	5	20	0	8.3	AB
Lawn Restore	10 lbs	30 day	10	5	5	8.7	AB
Fungo 50	8 oz.	21 day	10	10	10	10.0	ABC
Cleary Sulfur F	1 pt	30 day	10	15	5	10.0	ABC
Cleary 3336	4 oz	21 day	15	15	2	10.7	ABCD
Cleary Sulfur F	5 pts	(1 time only)	10	15	10	11.7	ABCD
Banner	2 fl oz	21 day	15	10	15	13.3	ABCD
Banner	4 fl oz	21 day	20	15	5	13.3	ABCD
Green Magic	1 qt	30 day	10	20	10	13.3	ABCD
Chipco 26019	2 oz	21 day	20	20	10	16.7	ABCDE
Bayleton	4 oz	21 day	30	10	15	18.3	ABCDE
Phosphorus(0-46-0)	1 lb. P	30 day	20	20	20	20.0	ABCDE
Check	--	--	15	30	25	23.3	BCDE
Bayleton	2 oz	21 day	20	25	30	25.0	CDE
Urea	1/2 lb N	30 day	40	20	15	25.0	CDE
Fungo 50	4 oz	21 day	20	50	10	26.7	DE
Chipco 26019	4 oz	21 day	15	25	50	30.0	E

<sup>1</sup> Treatments followed by the same letter are not significantly different from each other at the 5% level.



Table 4. Anthracnose Fungicide Study.

Glen Gary Golf Club, Holland, Ohio  
Rating date - 8/28/86  
Percent plot area infected with anthracnose

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>Ave.</u>
Lesco 0586	3.5 oz	14 day	0	0	0	0.0
DPX H6573	1 oz ai.	21 day	0	0	0	0.3
HWG 1608	0.25 oz ai.	21 day	0	0	1	0.3
SN596						
+ Prochloraz	0.5 oz + 3 fl oz	21 day	0	2	2	1.3
DPX H6573	0.25 oz ai.	21 day	0	0	5	1.7
Prochloraz	4.5 fl oz	21 day	0	1	10	3.7
PP 523 + X-77	4 gm ai. + .05%	21 day	0	10	2	4.0
RH 3486	2 oz	21 day	0	2	10	4.0
Daconil 2787						
+ Bayleton	3 fl oz + 1 oz	10 day	2	0	10	4.0
HWG 1608	0.06 oz ai.	21 day	0	3	10	4.3
Tersan 1991	2 oz	21 day	1	2	10	4.3
A-1555	6 fl oz	21 day	0	5	10	5.0
RH 3486	4 oz ai.	21 day	0	1	15	5.3
DPX H6573	0.5 oz ai.	21 day	0	10	10	6.7
SN 596	0.5 oz	21 day	0	1	20	7.0
SN 596						
+ Prochloraz	0.5 oz + 1.5 fl oz	21 day	0	2	20	7.3
SN 596	1.0 oz	21 day	0	5	20	8.3
DPX H6573	0.125 oz ai.	21 day	0	10	15	8.3
PP 523 + X-77	6 gm ai. + .05%	21 day	0	10	15	8.3
Tersan 1991	1 oz	21 day	0	10	15	8.3
Vorlan						
+ Fungo 50	2 oz + 2 oz	14 day	0	0	25	8.3
Cleary 3336	2 oz	21 day	0	5	20	8.3
PP 523 + X-77	8 gm ai. + .05%	21 day	0	5	25	10.0
Daconil 2787						
+ Urea	3 fl oz + 0.25 lb N.	14 day	2	5	25	10.7
Fungo 50	2 oz	14 day	0	5	30	11.7
Fungo 50	1 oz	14 day	2	10	25	12.3
DPX H6573	0.06 oz ai.	21 day	2	25	15	14.0
HWG 1608	0.12 oz ai.	21 day	0	10	35	15.0
Daconil 2787	6 fl oz	10 day	5	15	25	15.0
Vorlan						
+ Fungo 50	1 oz + 1 oz	14 day	1	5	40	15.3
San 619	3.5 gm ai.	21 day	1	20	25	15.3
Bayleton	1 oz	10 day	2	20	25	15.7
Cleary 3336	1 oz	21 day	0	20	30	16.7
Banner	1 fl oz	21 day	1	10	40	17.0
Lesco 0586	2.2 oz	14 day	1	20	30	17.0
RH 3486	1 oz ai.	21 day	0	25	30	18.3
Vorlan						
+ Fungo 50	1 oz + 1 oz	14 day	0	5	50	18.3
Daconil 2787						
+ Urea	3 fl oz + 0.25 lb N.	14 day	0	25	30	18.3
Vorlan	1 oz	14 day	0	5	50	18.3

San 619	1.75 gm. ai.	21 day	0	25	35	20.0
San 619	7 gm. ai.	21 day	0	25	35	20.0
Daconil 2787	6 fl oz	14 day	0	25	40	21.7
Daconil 2787						
+ Urea	6 fl oz + 0.5 lb N.	14 day	0	20	50	23.3
Check	--	--	0	25	45	23.3
Daconil 2787	3 fl oz	14 day	2	20	50	24.0
Daconil 2787						
+ Urea	3 fl oz + 0.5 lb N.	14 day	10	35*	35*	26.7
Lesco R 09524	6 oz	14 day	1	40	40	27.0
Daconil 2787	3 fl oz	10 day	5	40	40	28.3
Lesco R 09524	3 oz	14 day	1	35	50	28.7
Vorlan	2 oz	14 day	0	40	50	30.0

<sup>1</sup> Treatment followed by the same letter are not significantly different at the 5% level.

\* Mild phytotoxicity expressed as a leaf tip burn.

Table 5. Emerald Creeping Bentgrass Dollar Spot Fungicide Study - 1986

Hancock Turfgrass Research Center, M.S.U., E. Lansing, MI  
Disease rating: number of dollar spots/plot  
Rating data - 10/3/86

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE DMR<sup>1</sup></u>
Daconil 2787	3 fl oz	10 day	0	0	0	0.0 A
Daconil 2787	6 fl oz	10 day	0	0	0	0.0 A
Daconil 2787						
+ Bayleton	3 fl oz + 1 oz	10 day	0	0	0	0.0 A
Daconil 2787						
+ Bayleton	6 fl oz + 1 oz	10 day	0	0	0	0.0 A
Bayleton	1 oz	10 day	0	0	0	0.0 A
PP523 + X-77	4 gm ai. + .05%	21 day	0*	0*	0*	0.0 A
PP523 + X-77	6 gm ai. + .05%	21 day	0**	0***	0**	0.0 A
PP523 + X-77	8 gm ai. + .05%	21 day	0***	0**	0*	0.0 A
SAN 619	1.75 gm ai.	21 day	0*	0**	0*	0.0 A
SAN 619	3.5 gm ai.	21 day	0*	0**	0*	0.0 A
SAN 619	7 gm ai.	21 day	0*	0**	0**	0.0 A
DPX H6573	.125 gm ai.	21 day	0	0	0	0.0 A
DPX H6573	.25 gm ai.	21 day	0	0	0	0.0 A
DPX H6573	1 oz ai.	21 day	0	0	0	0.0 A
RH 3486	2 oz ai.	21 day	0	0	0	0.0 A
RH 3486	4 oz ai.	21 day	0	0	0	0.0 A
Lesco 0586	3.5 oz	14 day	0	1	0	0.3 A
Daconil 2787	6 fl oz	14 day	0	0	2	0.7 A
Chipco 26019 WP	2 oz ai.	21 day	0	3	0	1.0 AB
Chipco 26019 Fl	2 oz ai.	21 day	0	5	0	1.7 ABC
Rubigan AS	1.6 oz	21 day	5	0	0	1.7 ABC
RH 3486	1 oz ai.	21 day	5	0	0	1.7 ABC
DPX H6573	.06 oz ai.	21 day	0	4	1	1.7 ABC
Lesco 0586	2.2 oz	14 day	1	7	0	2.7 ABC

Daconil 2787								
+ Urea	3 fl oz + 1/2 lb N.	14 day	0	0	13	4.3	ABC	
Vorlan	2 oz	21 day	12	3	0	5.0	ABC	
Chipco 26019 Fl	.5 oz ai.	21 day	3	0	17	6.7	ABC	
Vorlan								
+ Fungo 50	2 oz + 2 oz	21 day	1	19	1	7.0	ABC	
Daconil 2787								
+ Urea	6 fl oz + 1/4 lb N.	14 day	0	16	5	7.0	ABC	
Daconil 2787	3 fl oz	14 day	1	6	15	7.3	ABC	
Rubigan WP	.4 oz	21 day	8	17	6	10.0	ABCD	
Daconil 2787								
+ Urea	6 fl oz + 1/2 lb N.	14 day	0	32	0	10.7	ABCD	
Lesco R-09524	3 oz	14 day	18	5	13	12.0	ABCDE	
Vorlan								
+ Fungo 50	1 oz + 1 oz	21 day	33	3	0	12.0	ABCDE	
DPX H6573	.03 oz ai.	21 day	3	34	1	12.7	ABCDE	
Rubigan WP	.2 oz	21 day	17	37	9	21.0	ABCDEF	
Vorlan	1 oz	21 day	27	41	0	22.7	ABCDEF	
Daconil 2787								
+ Urea	3 fl oz + 1/4 lb N.	14 day	5	56	8	23.0	ABCDEF	
Rubigan AS	.8 oz	21 day	12	26	33	23.7	ABCDEF	
Chipco 26019 WP	.5 oz ai.	21 day	44	23	6	24.3	ABCDEF	
Tersan 1991	1 oz	21 day	35	26	15	25.3	BCDEF	
Lesco R-09524	6 oz	14 day	18	12	48	26.0	CDEF	
Cleary 3336	1 oz	21 day	38	13	46	32.3	DEFG	
Cleary 3336	2 oz	21 day	83	5	18	35.3	EFG	
Tersan 1991	2 oz	21 day	46	52	13	37.0	FGH	
Fungo 50	1 oz	21 day	55	58	20	44.3	FGH	
Fungo 50	2 oz	21 day	53	56	40	49.7	GH	
Check	--	--	78	42	53	57.7	H	

\* Mild phytotoxicity characterized by darker green turf.

\*\* Moderate phytotoxicity characterized by even darker green color with some plant growth regulation characteristics such as wider leaves, etc.

\*\*\* Rather severe changes in plant leaf width, etc and a very deep green color with some brown leaf tip burn.

<sup>1</sup> Treatments followed by the same letter are not significantly different at the 5% level.

Table 6. Emerald Creeping Bentgrass Daconil 2787 - Sulfur Study - 1986

Hancock Turfgrass Research Center, MSU, E. Lansing, Mi.  
 Rating scale: number of dollar spots/plot  
 Rating date: Sept. 29, 1986

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE</u>	<u>DMR<sup>1</sup></u>
Daconil 2787	3 fl oz	14 day	0	0	0	0	A
SDS 63539 (Daconil 2787 + Sulfur)	6 oz	14 day	3	4	2	3	A
Sulfur F (Cleary)	3 fl oz	14 day	136	155	134	141.7	B
Check	--	--	166	146	160	157.3	B

<sup>1</sup> Treatments followed by the same letter are no significantly different from each other at the 5% level.

Table 7. Loretta Perennial Ryegrass Daconil 2787 - Sulfur Study - 1986

Hancock Turfgrass Research Center, MSU, E. Lansing, Mi.  
 Rating scale: Percent of plot area infected with brown patch  
 Rating date: July 23, 1986

<u>Treatment</u>	<u>Rate/1000 ft<sup>2</sup></u>	<u>Interval</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE</u>	<u>DMR<sup>1</sup></u>
SDS 63539 (Daconil 2787 + Sulfur)	6 oz	14 day	5	10	10	8.3	A
Daconil 2787	3 fl oz	14 day	20	5	2	9.0	A
Sulfur F (Cleary)	3 fl oz	14 day	10	5	25	13.3	A
Check	--	--	5	50	30	28.3	A

<sup>1</sup> Treatments followed by the same letter are not significantly different from each other at the 5% level.

Fertility Timing - Melting Out Disease Study - 1985-86

Our long-term investigation into the relationship between fertility and melting-out disease severity on Kentucky bluegrass continued during the past year with a study initiated in the fall of 1985 on irrigated Kenblue Kentucky bluegrass at the Hancock Turfgrass Research Center on the MSU campus. Urea and IBDU fertilizers were applied in varying amounts in the fall of 1985 and the spring of 1986. Turfgrass quality and melting-out (*Dreischlera poae*) disease levels were determined for each treatment on June 13, 1986.

The study was laid-out in three replications of a random block design utilizing 6' x 6' plots. Treatments were pre-weighed and applied by hand. No other fertility was applied to the plot area for the duration of the study.

The results of this study indicate that timely fertility applications can be useful in reducing the severity of melting-out disease (Table 8) and in improving over-all turfgrass quality in the spring (Table 9).

Table 8. Fertility Timing - Melting-Out Disease Study - 1985-86

Hancock Turfgrass Research Center, MSU, E. Lansing, MI  
 Turfgrass disease rating scale: 1 (no disease) - 9 (90% infection or greater)  
 Rating date: 6/13/86

<u>Nitrogen Carrier</u>	<u>Application Date and Rate</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE</u>	<u>DMR*</u>
IBDU (Fine)	March '86 - 1 1/2 lb N.	1	1	2	1.3	A
IBDU (Fine)	Nov. '85 - 1 lb N., March '86 - 1 1/2 lb N.	1	2	2	1.7	AB
Urea	Nov. '85 - 1 lb N., March '86 - 3/4 lb N., May '86 - 3/4 lb N.	1	3	2	2.0	AB
Urea	March '86 - 3/4 lb N., May '86 - 3/4 lb N.	2	2	2	2.0	AB
Urea	Nov. '85 - 1 lb N.	2	3	5	3.3	B
IBDU (Fine)	Nov. '85 - 1 lb N.	1	5	4	3.3	B
Check	--	4	6	5	5.0	C

Table 9. Fertility Timing - Melting-Out Disease Study - 1985-86

Hancock Turfgrass Research Center, MSU, E. Lansing, MI  
 Turfgrass quality rating scale: 1(best) - 9(worst)  
 Rating date: 6/13/86

<u>Nitrogen Carrier</u>	<u>Application Date and Rate</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE</u>	<u>DMR*</u>
IBDU (Fine)	March '86 - 1 1/2 lb N.	1	1	2	1.3	A
IBDU (Fine)	Nov. '85 - 1 lb N.,					

	March '86 - 1 1/2 lb N.	1	2	2	1.7	A
Urea	March '86 - 3/4 lb N.,					
	May '86 - 3/4 lb N.	2	2	2	2.0	A
Urea	Nov. '85 - 1 lb N.,					
	March '86 - 3/4 lb N.,					
	May '86 - 3/4 lb N.	1	3	2	2.0	A
Urea	Nov. '85 - 1 lb N.	1	3	5	3.0	AB
IBDU (Fine)	Nov. '85 - 1 lb N.	2	6	5	4.3	BC
Check	--	4	6	6	5.3	C

\* Treatments followed by the same letter are not significantly different from each other at the 5% level of significance.

#### Fungicides Tested In 1985-86

<u>Product</u>	<u>% Active Ingredient</u>	<u>Producer</u>
AD-TGF	2.1% WP	Nor-Am Chemical Co.
Banner	1.1 EC	Ciba-Geigy Corp.
Bayleton	25% DF	Mobay Chemical Corp.
BRC 916	12% EC	ICI Americas, Inc.
Bromosan F	45% FL	W.A. Cleary Chemical Corp.
Calo-Clor	90% WP	Mallinckrodt, Inc.
Calo-Gran	2.7% GR	Mallinckrodt, Inc.
Chipco 26019 FL	240 gm. ai./l	Rhone Poulenc Inc.
Chipco 26019	50% WP	Rhone Poulenc Inc.
Clearys 3336	50% WP	W.A. Cleary Corp.
Cleary Sulfur F	6 lbs. ai./gal.	W.A. Cleary Corp.
Daconil 2787	40.4% FL	Fermenta Plant Protection Co.
DPX-H6573	20% DF	E.I. DuPont de Nemours, Inc.
Dyrene 4F	38.5% FL	Mobay Chemical Corp.
Fluf	18-0-0 flowable fertilizer	W.A. Cleary Chemical Corp.
Fungo 50	50% WP	Mallinckrodt, Inc.
Green Magic	20-0-2 fertilizer	Agro-Chem., Inc.
HWG 1608	25% WP	Mobay Chemical Corp.
IBDU (Fine)	32-0-0 fertilizer	Par-Ex Corp.
Lawn Restore	9-4-4 fertilizer	Ringer Corp.
Lesco 0586	N.A.	Lesco Chemical Corp.
Lesco R-09524	N.A.	Lesco Chemical Corp.
NC 28410	N.A.	Nor-Am Chemical Co.
Phosphorus	0-46-0	--
PMAS	10% EC	W.A. Cleary Chemical Corp.
PP 450	12.5% EC	ICI Americas, Inc.
PP 523	5% SG	ICI Americas, Inc.
Prochloraz EC	42.9% EC	Nor-Am Chemical Corp.
Prochloraz-MN/ Chlorothalonil	64% WP	Nor-Am Chemical Corp.
RH-3486	50% WP	Rohm and Haas Co.
Rizolex EC	N.A.	Mallinckrodt, Inc.
Rizolex WP	50% WP	Mallinckrodt, Inc.
Rubigan	50% WP	Elanco
Rubigan AS	11.6% FL	Elanco
S-1555	N.A.	O. M. Scotts & Sons

SAN-619	40% WP	Zoecon Corp.
Scotts F + FII	14-3-3 fertilizer, 15.4% PCNB	O. M. Scotts & Sons
SDS 63539	3 lbs. ai. sulfur, 2 lbs ai. chlorothalonil/gal.	SDS Biotech Corp.
SN 84364	50% WP	Nor-Am Chemical Co.
Tersan 1991	50% WP	E.I. DuPont de Nemours & Co.
Urea	46-0-0 fertilizer	--
Vorlan	50% WP	Mallinckrodt, Inc.
X-77	Spreader/sticker	Nor-Am Chemical Co.