TURFGRASS DISEASE MANAGEMENT REPORT - 1984-1985

J. M Vargas, Jr., R. Detweiler, S. Beiber, M. Hendricks and V. Sheridan
Dept. of Botany and Plant Pathology
Michigan State University

SNOW MOLD FUNGICIDE TRIALS - 1984-1985

The 1984-85 snow mold fungicide studies #1 and #2 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, 1984. The sprayable formulations were applied with a CO_2 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 17, 1985, immediately following snow cover melt-off.

As can be seen from the controls, disease pressure was moderately severe in both studies 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). It should be mentioned that the treatments which combined a fertilizer carrier with Calo-Clor (study #2) generally produced a higher quality (greener) turf than where the Calo-Clor component was used by itself, although there was no effect on disease control.

BOYNE HIGHLANDS SNOW MOLD FUNGICIDE STUDY #1 - 1984-85

Boyne Highlands Resort
Harbor Springs, MI
Plots rated 4/17/85

Percent plot area infected with all snow molds.
(Typhula incarnata, Typhula ishikariensis, Fusarium nivale)

Treatment	Rate/1000/ft	Rep.I	Rep.II	Rep.III	Ave	DMR (.05)
Scotts F + F II	2X	0	0	0	0	A
Calo-Clor	3 oz	0	1*	0*	.3	A
Calo-Gran	6 lbs	0	1*	1	.7	A
Scotts F + F II	1X	1	0	1	.7	A
Daconil 2787 + Tersan 1991	8 fl oz + 2 oz	2	1	0	1	A
Banner/ Chlorothalonil	6 oz	2	5	0	2.3	A
XE-779	.062 lb ai.	2*	1*	5	2.7	A
Daconil 2787	8 fl oz	5	3	5	4.3	AB
Caddy, Spotrete F, Clearspray	1 fl oz, 6 fl oz 6 fl oz	10	3	I	4.7	AB

Treatment	Rate/1000/ft	Rep.I	Rep.II	Rep.III	Ave	DMR (.05)
XE-779	.032 lb ai.	10	5	3	6	ABC
PMAS	2 fl oz	0	4	20	8	ABCD
Banner	4 fl oz	5	20	7	10.7	ABCD
Banner/ Manzate 200	2 fl oz + 4 oz	20	25	2	I5.7	ABCDEFG
SN 84364, Prochloraz WP X-77	2.4 oz ai. 3 oz ai. 25%	5	40	2	15.7	ABCDEF
PMAS, Spotrete F Clearspray	2 fl oz. 6 fl oz. 6 fl oz.	2	40	15	19	ABCDEFGH
BAS 45406F	4.2 fl oz	10	20	35	21.7	ABCDEFGH
Daconil 2787	3 fl oz	35	30	3	22.7	ABCDEFGH
SN 84364 + X-77	2.4 oz ai. + 25%	45	20	10	25	ABCDEFGH
Spotrete WP + Sulfur F	8 oz + 16 fl oz	10	30	40	26.7	ABCDEFGH
SN 84363, Prochloraz WP X-77	1.7 oz ai. 3 oz ai 25%	10	40	30	26.7	ABCDEFGH
Manzate 200	4 oz	50	25	30	35	ABCDEFGHI
Spotrete F + Sulfur F	6 fl oz + 16 fl oz	20	60	30	36.7	CDEFGHI
Spotrete F	6 fl oz	40	40	30	36.7	DEFGHI
Prochloraz WP + X-77	3 oz ai. + 25%	25	60	40	41.7	EFGHIJ
SN 84364 + X-77	1.7 oz ai. + 25%	50	30	45	41.7	EFGHIJ
PMAS + Sulfur F	2 fl oz + 16 fl oz	75	14	40	43	EFGHIJ
Spotrete WP	8 oz	50	45	45	46.7	FGHIJ
Caddy	1 fl oz	50	50	40	46.7	GHIJ
Cleary Granular Fungicide	4 lbs	50	50	40	46.7	GHIJ
Prochloraz EC	3 oz ai.	60	80	1	47	HIJ
BAS 45406F	2.8 fl oz	25	45	80	50	HIJK
Prochloraz EC	1.5 oz ai.	50	30	65	58.3	IJK
Tersan 1991	2 oz	60	80	50	63.3	IJK
Control	-	70	60	60	63.3	IJK
Sulfur F	16 fl oz	35	90	90	7I.7	JK
Cadtrete Gr. Fungicide	8 lbs	80	80	75	78.3	K

Note: Treatments followed by the same letter are not significantly different from each other at the 5% level.
* Indicates slight phytotoxicity (yellowing).

BOYNE HIGHLANDS SNOW MOLD FUNGICIDE STUDY #2 - 1984-85

Boyne Highlands Resort
Harbor Springs, MI

Plots rated 4/17/85
Percent plot area infected with all snow molds.
(Typhula incarnata, Typhula ishikariensis, Fusarium nivale)

Treatment	Rate/1000 ft2	Rep.I	Rep.II	Rep.III	Ave
Calo-Clor	3 oz	0*	0*	0*	0 A
Calo-Clor + Urea	3 oz + 1 lb N.	1	1	1	1 A
Calo-Clor + MC1-55	3 oz + 3.64 lbs	2	0	1	1 A
Calo-Clor + MC1-55	3 oz + 1.82 lbs	1	2	5	2.7 A
Calo-Clor + Urea	3 oz + 2 lb N.	10	5	2	5.7 A
Calo-Clor	1.5 oz	0*	10	15	8.3 A
Calo-Clor + Urea	i.5 oz + 1 lb N.	1	5	20	8.7 A
Calo-Clor + MC1-55	1.5 oz + 3.64 lbs	14	35	40	29.7 B
Control	-	80	80	85	81.7 C
Urea	1 lb. N.	90	80	85	85 C
MCI-55	1.82 lbs	90	90	90	90 C
MCI-55	3.64 lbs	90	90	90	90 C

Note: Treatment followed by the same letter are not significantly different from each other at the 5% level.
* Single asterisk (*) indicates slight phytotoxicity (yellowing).

KENTUCKY BLUEGRASS MELTING-OUT FUNGICIDE TRIAL - 1985

Hancock Turfgrass Research Center, MSU, E. Lansing, MI

The 1985 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_2 small-plot sprayer at 30 PSI at a volume of 48 gal/acre.

Treatments were initiated curatively on April 30, 1985 with subsequent applications being made on 14 or 21 day intervals as indicated by the data table. The plots were rated for disease on June 10, 1985, at which time the 14 day treatments had been applied three times and the 21 day treatments had been applied twice.

Disease pressure was relatively light this year due to the warm, dry weather we experienced during the spring season. Under these conditions, the spread between the lowest and highest treatment averages was rather narrow, but most of the compounds tested did give significant disease control, compared to the control.

KENTUCKY BLUEGRASS DRESCHLERA (MELTING OUT) FUNGICIDE STUDY 1985

Hancock Turfgrass Research Center
MSU, East Lansing, MI

Disease Rating: 1 (No disease) - 9(90% infection or greater)
Plots Rated 6/10/85

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
Chipco 26019 WP	.75 oz ai.	21 day	1	2	3	2	a
CGA 449	48 gm ai.	21 day	1	2	3	2	a
CGA 449	72 gm ai.	21 day	1	2	3	2	a
CGA 449	96 gm ai.	21 day	1	2	3	2	a
Chipco 26019 WP	1 oz ai.	21 day	2	3	2	2.3	ab
MF 729	2 oz	21 day	2	3	2	2.3	ab
Prochloraz EC + AD-TGF	5 fl oz + .34 oz	21 day	2	2	3	2.3	ab
CGA 449	24 gm ai.	21 day	2	3	3	2.7	abc
DPX H6573	2 oz ai.	21 day	2	3	3	2.7	abc
Dyrene 4F	2 oz	21 day	2	3	3	2.7	abc
Dyrene 4F	1 oz	14 day	2	3	3	2.7	abc
Prochloraz E	4.5 fl oz	21 day	2	2	4	2.7	abc
Vorlan	2 oz	21 day	2	3	3	2.7	abc
Chipco 26019 Fl	1 oz ai.	21 day	2	3	4	3	abcd
Daconil 2787	3 fl oz.	14 day	2	4	3	3	abcd
DPX H6573	.5 oz ai.	21 day	2	4	3	3	abcd
DPX H6753	1 oz ai.	21 day	3	2	4	3	abcd
Dyrene 4F	*	*	2	2	5	3	abcd
Prochloraz EC	3 fl oz	21 day	2	3	4	3	abcd
Prochloraz EC + AD-TGF	3 fl oz + .34 oz	21 day	2	5	2	3	abcd
Vorlan	1 oz	21 day	3	3	3	3	abcd
MF 745	3 oz	21 day	2	4	3	3	abcd
AD-TGF	.34 oz	21 day	2	4	4	3.3	abcde
Daconil 2787	6 fl oz	14 day	3	3	4	3.3	abcde
Dyrene 4F	1 oz	21 day	2	4	4	3.3	abcde
MF 729	1 oz	21 day	2	4	4	3.3	abcdef
Chipco 26019 Fl	.75 oz ai.	21 day	3	3	5	3.7	abcde
Duosan	3 oz	21 day	3	3	5	3.7	abcdef
Dyrene 4F	.5 oz	14 day	3	4	4	3.7	abcdef
MF 745	1.5 oz	21 day	3	3	5	3.7	abcdef
Banner	2 fl oz	21 day	3	4	5	4	bcdef
DPX H6573	.25 oz ai.	21 day	2	6	4	4	bcdef
Control	-	21 day	4	5	4	4.3	cdef
BRC 916	2 gm. ai.	21 day	6	5	3	4.7	def
PP 450	2 gm. ai.	21 day	3	6	6	5	ef
BRC 916	4 gm. ai.	21 day	7	3	6	5.3	f
PP 450	4 gm. ai.	21 day	6	6	4	5.3	f

* Applied 4 oz/1,000 ft2 followed in 14 days with 2 oz/1000 ft2 and thereafter at 14 day intervals with 1 oz/1000 ft2 (Curative Program).
Treatments followed by the same letter are not significantly different from each other at the 5% level.

ANTHRACNOSE FUNGICIDE STUDIES - 1985
Glen Gary Golf Club, Holland, Ohio

The Glen Gary anthracnose (colletotrichum graminicola) fungicide study was established on a moderately fertilized, irrigated annual bluegrass (Poa annua) fairway. The study was set up in three replications of a random block design with a 6' x 9' plot size. All liquid applications were made with a CO_2 small-plot sprayer at 30 PSI and 48 gal/acre. The area was mowed regularly at 1/2" height of cut.

Initial applications were made preventively on July 3. When the rating was taken on August 28, the 14 day treatments had been applied three times, the 21 day treatments had been applied three times and the 28 day treatments had been applied twice. The exceptions were Prochloraz (6 fl. oz.) and Prochloraz EC (4.5 fl oz) + AD-TGF (.34 oz.) which were applied only once (7/3) because of phytotoxicity.

A second anthracnose study was established at the Burroughs Farms Resort at Brighton, MI, but disease failed to develop in this study.

As the table indicates, disease pressure was light this year. We experienced a very cool summer with few hot and humid nights which are crucial for anthracnose development. Anthracnose damage was generally light throughout the state this year.

GLEN GARY ANTHRACNOSE FUNGICIDE STUDY - 1985

Glen Gary Golf Course, Holland, Ohio
Disease rating: percent infection/plot
Plots rated: 8/28/85

Treatment	Rate/1000 ft^2	Interval	Rep1	Rep2	Rep3	Ave.	DMR
S-1555	6 fl oz	21 day	0	0	0	0	a
S-1555	9 fl oz	21 day	0	0	0	0	a
DPX H6573	.25 oz ai.	21 day	0	0	0	0	a
DPX H6573	.5 oz ai.	21 day	0	0	0	0	a
DPX H6573	1 oz ai.	21 day	0	0	0	0	a
DPX 965 + DPX H6573	.5 oz ai.+ .25 oz ai	21 day	0	0	0	0	a
Prochloraz EC + AD-TGF4	.5 fl oz + 0.34 oz	21 day	0**	0**	0**	0	a
HWG 1608	0.25 oz ai.	21 day	0	0	0	0	a
Bayleton +CH 26019	1 oz + 1.5 oz	28 day	0	0	0	0	a
Fungo 50	1 oz	21 day	0	0	0	0	a
BRC 916	2 gm ai.	21 day	0	0	0	0	a
CGA-449	24 gm ai.	21 day	0*	0	0	0	a
Tersan 1991	1 oz	21 day	0	0	0	0	a
Cleary's 3336	1 oz	21 day	0	0	0	0	a
Cleary's 3336	2 oz	21 day	0	0	0	0	a
Lesco 0585	2.5 oz	21 day	0	0	0	0	a
Lesco 0585	4 oz	21 day	0	0	0	0	a
Daconil 2787	6 fl oz	14 day	1	0	0	0.3	a
DPX H6573	.125 oz ai.	21 day	1	0	0	0.3	a

Treatment	Rate/1000 ft^2	Interval	Rep1	Rep2	Rep3	Ave.	DMR
Daconil 2787	3 fl oz	14 day	2	0	0	0.7	a
S-1446	0.7 fl oz	14 day	0	2	0	0.7	a
Prochloraz EC	4.5 fl oz	21 day	2**	0*	0*	0.7	a
KWG 0519	.06 oz ai.	21 day	2	0	0	0.7	a
Bayleton	1 oz	28 day	0	2	0	0.7	a
Duosan	3 oz	21 day	2	0	0	0.7	a
BRC 916	4 gm ai.	21 day	0	2	0	0.7	a
S-1446	1.4 fl oz	14 day	0	0	5	1.7	a
DPX 965 + Dac. 2787	.5 oz ai. + 3 oz ai.	21 day	0	5	0	1.7	a
DPX 965	.5 oz ai.	21 day	5	0	0	1.7	a
Prochloraz EC	6 fl oz	21 day	0*	0**	5*	1.7	a
KWG 0519	.12 oz ai.	28 day	3	2	0	1.7	a
Fungo 50	2 oz	21 day	5	0	0	1.7	a
PP 450	4 gm ai.	21 day	0	5	0	1.7	a
Tersan 1991	2 oz	21 day	5	0	0	1.7	a
DPX 965 + Manzate 200	.5 oz ai. + 2.5 oz ai.	21 day	0	2	5	2.3	a
Bayleton	.5 oz	21 day	2	0	5	2.3	a
Banner	1 fl oz	21 day	0	2	5	2.3	a
Lesco 63539	3 fl oz	14 day	5	0	2	2.3	a
PP450	2 gm ai.	21 day	0	10	0	3.3	ab
CGA-449	8 gm ai.	21 day	2	10	0	4	ab
Lesco 63539	6 fl oz	14 day	0	7	5	4	ab
MF 745	2 oz	21 day	5	0	10	5	ab
CGA-449	6 gm ai.	21 day	10	0	5	5	ab
CGA-449	12 gm ai.	21 day	15	2	0	5.7	ab
Manzate 200	2.5 oz ai.	21 day	1	5	20	8.7	ab
Daconil 2787	3 oz ai.	21 day	10	5	25	13.3	bc
Prochloraz EC + AD-TGF	3 fl oz + .34 oz	21 day	0*	0**	40*	13.3	bc
Check	-	-	0	10	30	13.3	bc
MF 745	1 oz	21 day	35	20	5	20	cd
AD-TGF	.34 oz	21 day	25	20	30	25	d

Treatments followed by the same letter(s) are not significantly different from each other at the 5% level. Notes:

* Indicates slight phytotoxicity (stunting, some discoloration) on 7/26

** Indicates moderate phytotoxicity (increased stunting, leaf necrosis) on 7/26.

DOLLAR SPOT FUNGICIDE STUDIES - 1985

The 1985 dollar spot (*Moellerodiscus sp.*, *Lanzia sp.*) fungicide studies were conducted at three sites as detailed below. All treatments were applied to three replicate plots in a random block design using a CO_2 small plot sprayer operating at 30 PSI and a volume of 48 gal/A. All ratings were taken visually on a scale of 1-9 (1= no disease, 9= 90% infection or greater).

Fylking Kentucky Bluegrass Dollar Spot Fungicide Study

This study was applied curatively on an irrigated, moderately fertilized, bluegrass research area at the Hancock Turfgrass Research Center in East Lansing. Treatments were initiated on August 29 to 3' x 9' plots with subsequent applications being made at 14, 21 and 28 day intervals. By the date of the ratings (Sept. 26), the 14 day and 21 day treatments had been applied twice and the 28 day treatments had been applied once.

Delray Perennial Ryegrass Dollar Spot Study

This study was conducted on an irrigated, moderately fertilized perennial ryegrass research area at the Hancock Turfgrass Research Center in E. Lansing. Treatments were applied curatively to 3' x 4' plots on August 21 with subsequent applications being made at 14, 21 and 28 day intervals. By the date of the rating (Sept. 22), the 14 day treatments had been applied three times, the 21 day treatments were applied twice and the 28 day treatments were applied twice.

Glen Gary Annual Bluegrass Benzimidazole Resistant Dollar Spot Study

The benzimidazole - resistant dollar spot study was conducted on an irrigated, moderately fertilized annual bluegrass (Poa annua) fairway at the Glen Gary Golf Course in Holland, Ohio. Treatments were applied preventively to 6' x 9' plots on July 3 with subsequent applications being made on 14,21 and 28 day intervals. By the time ratings were taken (August 28), the 14 day treatments had been applied four times, the 21 day treatments had been applied three times and the 28 day treatments had been applied twice.

As would be expected, the benzimidazole fungicides (Tersan 1991, Fungo 50, and Clearys 3336) performed poorly against the resistant dollar spot strains, confirming the results of our laboratory bioassay which showed moderate levels of benzimidazole resistance in the dollar spot isolates from the Glen Gary course.

GLEN GARY ANNUAL BLUEGRASS
BENZIMIDAZOLE-RESOSTAMT DOLLAR SPOT FUNGICIDE STUDY - 1985
Glen Gary Golf Course, Holland, Ohio
Disease Rating: 1(no disease) - 9(90% infection or greater)
Plots rated 8/28/85

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
Daconil 2787	3 fl oz	14 day	1	1	1	1	a
Daconil 2787	6 fl oz	14 day	1	1	1	1	a
S-1555	6 fl oz	21 day	1	1	1	1	a
S-1555	9 fl oz	21 day	1	1	1	1	a
S-1446	0.7 fl oz	14 day	1	1	1	1	a
S-1446	1.4 fl oz	14 day	1	1	1	1	a
DPX H6573	.125 oz ai	21 day	1	1	1	1	a
DPX H6573	.25 oz ai	21 day	1	1	1	1	a
DPX H6573	.5 oz ai	21 day	1	1	1	1	a
DPX H6573	1 oz ai	21 day	1	1	1	1	a

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
DPX 965 + DPX H6573	.5 oz ai + .25 oz ai	21 day	1	1	1	1	a
Prochloraz EC	4.5 fl oz	21 day	1	1	1	1	a
Prochloraz EC + AD-TGF	3 fl oz + 0.34 oz	21 day	1	1	1	1	a
HWG 1608	0.25 oz ai	21 day	1	1	1	1	a
KWG 0519	.06 oz ai.	21 day	1	1	1	1	a
KWG 0519	.12 oz ai.	28 day	1	1	1	1	a
Bayleton + CH26019	1 oz + 1.5 oz	28 day	1	1	1	1	a
MF 745	2 oz	21 day	1	1	1	1	a
PP 450	2.0 gm ai.	21 day	1	1	1	1	a
PP 450	4.0 gm ai.	21 day	1	1	1	1	a
BRC 916	2.0 gm ai.	21 day	1	1	1	1	a
BRC 916	4.0 gm ai.	21 day	1	1	1	1	a
Banner	1.0 fl oz	21 day	1	1	1	1	a
Lesco 0585	2.5 oz	21 day	1	1	1	1	a
Lesco 0585	4.0 oz	21 day	1	1	1	1	a
DPX 965 + Daconil 2787	.5 oz ai. 3 oz ai.	21 day	1	1	2	1.3	ab
DPX 965 + Manzate 200	.5 oz ai. + 2.5 oz ai.	21 day	1	2	1	1.3	ab
Daconil 2787	3 oz ai.	21 day	1	1	2	1.3	ab
Actidione-TGF (AD-TGF)	0.34 oz	21 day	1	1	2	1.3	ab
Bayleton	0.5 oz	21 day	2	1	1	1.3	ab
Bayleton	1.0 oz	28 day	2	1	1	1.3	ab
Fungo 50	2.0 oz	21 day	1	1	2	1.3	ab
Lesco 63539	6.0 fl oz	14 day	1	2	1	1.3	ab
Prochloraz EC + AD-TGP	4.5 fl oz + .34 oz	21 day	1	1	3	1.7	abc
MF 745	1.0 oz	21 day	1	1	3	1.7	abc
CGA 449	8.0 gm ai.	21 day	1	1	3	1.7	abc
CGA 449	12 gm ai.	21 day	1	2	2	1.7	abc
Tersan 1991	1.0 oz	21 day	2	1	2	1.7	abc
Prochloraz EC	6.0 fl oz	21 day	1	4	1	2	abc
Lesco 63539	3.0 fl oz	14 day	2	2	2	2	abc
Manzate 200	2.5 oz ai.	21 day	3	2	3	2.7	abc
CGA 449	24 gm ai.	21 day	2	4	2	2.7	abc
CGA 449	6.0 gm ai.	21 day	1	6	2	3.0	bc
Tersan 1991	2.0 oz	21 day	3	4	2	3.0	bc
Check	-	-	2	2	5	3.0	bc
DPX 965	.25 oz ai.	21 day	1	6	3	3.3	c
Fungo 50	1.0 oz	21 day	1	2	7	3.3	c
Duosan	3.0 oz	21 day	1	5	4	3.3	c
Cleary 3336	1.0 oz	21 day	5	4	6	5.0	d
Cleary 3336	2.0 oz	21 day	5	6	4	5.0	d

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

FLYKING BLUEGRASS DOLLAR SPOT FUNGICIDE STUDY - 1985
Hancock Turfgrass Research Center
MSU, E. Lansing, MI 48824
Disease Rating: 1(no disease) - 9(90% infection or greater)
Plots rated on 9/26/85

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
Prochloraz EC + AD-TGF	3 fl oz + .34 oz	21 day	1**	1**	1*	1	a
MF 745	2 oz	21 day	1	1	1	1	a
Prochloraz EC+ AD-TGF	4.5 fl oz + .34 oz	21 day	1**	1**	1**	1	a
Tersan 1991	1 oz	21 day	1	1	1	1	a
Daconil 2787	6 fl oz	14 day	2	1	1	1.3	abd
PP 450	4 gm ai.	21 day	1	2*	1*	1.3	abd
Banner	1 fl oz	21 day	1	2	1	1.3	abd
MF 690	2 oz	14 day	1	2	1	1.3	abd
MF 690	2 oz	21 day	1	2	1	1.3	abd
Prochloraz EC	6 fl oz	21 day	1	2*	1	1.3	abd
Tersan 1991	2 oz	21 day	1	2	1	1.3	abd
DPX H6573	.32 oz	21 day	3	1	1	1.7	abcdef
PX H6573	.63 oz	21 day	3	1	1	1.7	abcdef
DPX H6573	2.5 oz	21 day	3	1	1	1.7	abcdef
Prochloraz EC	4.5 fl oz	21 day	3	1*	1*	1.7	abcdef
Bayleton + CH 26019	1 oz + 1.5 oz	28 day	2	2	1	1.7	abcdef
BRC 916 + X-77	4 gm ai. + 0.05%	21 day	2	2	1	1.7	abcdef
Lesco 0585	4 oz	21 day	2	2	1	1.7	abcdef
MF 729	2 oz	14 day	1	2	2	1.7	abcdef
MF 729	2 oz	21 day	2	2	1	1.7	abcdef
MF 745	2 oz	14 day	2	2	1	1.7	abcdef
Cleary's 3336	2 oz	21 day	2	2	1	1.7	abcdef
S-1555	9 fl oz	21 day	2	3	1	2.0	abcdef
DPX H6573	1.3 oz	21 day	2	2	2	2.0	abcdef
Vorlan	2 oz	21 day	2	2	2	2.0	abcdef
MF 729	1 oz	14 day	3	2	1	2.0	abcdef
Cleary's 3336	1 oz	21 day	1	3	2	2.0	abcdef
Fungo 50	1 oz	21 day	2	2	2	2.0	abcdef
Fungo 50	2 oz	21 day	2	2	2	2.0	abcdef
Chipco 26019 Fl	1 oz ai.	21 day	2	2	2	2.0	abcdef
BRC 916 + X-77	2 gm ai. + 0.05%	21 day	3	2	2	2.3	bcdefg
Chipco 26019 Fl	0.75 oz ai.	21 day	3	2	2	2.3	bcdefg
Vorlan	1 oz	21 day	2	3	2	2.3	bcdefg
MF 745	1 oz	14 day	2	3	2	2.3	bcdefg
S-1555	6 fl oz	21 day	2	4	2	2.7	defgh
S-1446	0.7 fl oz	14 day	3	3	2	2.7	defgh
S-1446	1.4 fl oz	14 day	3	3	2	2.7	defgh
Bayleton	1 oz	28 day	4	3	1	2.7	defgh
PP 450	2 gm ai.	21 day	3	3	2	2.7	cdefgh
Lesco 0585	2.5 oz	21 day	2	4	2	2.7	cdefgh
MF 745	1 oz	21 day	3	3	2	2.7	cdefgh
Bayleton	1 oz	21 day	2	4	2	2.7	cdefgh
Daconil 2787	3 fl oz	14 day	3	3	3	3.0	fghi

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
Chipco 26019 WP	1 oz ai.	21 day	3	4	2	3.0	efghi
MF 729	1 oz	21 day	2	4	3	3.0	efghi
MF 690	1 oz	14 day	3	3	3	3.0	efghi
Chipco 26019 WP	.75 oz ai.	21 day	4	4	2	3.3	ghi
MF 690	1 oz	21 day	4	4	3	3.7	hij
CGA 449	24 gm ai.	21 day	5	4	1	4.0	ij
Lesco 63539	6 fl oz	14 day	5	5	4	4.7	
Bayleton	0.5 oz	21 day	4	5	5	4.7	
Actidione-TGF (AD-TGF)	1 oz	21 day	6*	4	4*	4.7	
CGA-449	12 gm ai.	21 day	6	6	6	6.0	k
Lesco 63539	3 fl oz	14 day	7	6	5	6.0	k
Control	-	-	6	7	7	6.7	k
CGA-449	6 gm ai.	21 day	8	8	5	7.0	k
CGA-449	8 gm ai.	21 day	7	7	7	7.0	k

Notes: Treatments followed by the same letter(s) are not significantly different from each other at the 5 % level. * Indicates slight phytotoxicity (yellowing and/or stunting)
** Indicates moderate phytotoxicity (leaf tip browning, stunted growth)

DELRAY RYEGRASS DOLLAR SPOT FUNGICIDE STUDY - 1985
Hancock Turfgrass Research Center
MSU, East Lansing, MI 48824
Disease rating: 1(no disease) - 9(90% infection or greater)
Plots rated 9/22/85

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
Daconil 2787	3 fl oz	14 day	1	1	1	1	a
Daconil 2787	6 fl oz	14 day	1	1	1	1	a
S-1446	.7 fl oz	14 day	1	1	1	1	a
DPX H6573	.125 oz ai.	21 day	1	1	1	1	a
DPX H6573	.25 oz ai.	21 day	1	1	1	1	a
DPX H6573	.5 oz ai.	21 day	1	1	1	1	a
DPX H6573	1 oz ai.	21 day	1	1	1	1	a
BRC 916 + X-77	2 gm ai. + .05%	21 day	1	1	1	1	a
BRC 916 + X-77	1 gm ai. + .05%	21 day	1	1	1	1	a
PP 450	4 gm ai.	21 day	1	1	1	1	a
Banner	1 fl oz	21 day	1	1	1	1	a
Lesco 0585	2.5 oz	21 day	1	1	1	1	a
Lesco 0585	4 oz	21 day	1	1	1	1	a
Lesco 63539	6 fl oz	14 day	1	1	1	1	a
Chipco 26019 WP	.75 oz ai.	21 day	1	1	1	1	a
Chipco 26019 FL	.75 oz ai.	21 day	1	1	1	1	a
Vorlan	2 oz	21 day	1	1	1	1	a
MF 729	2 oz	14 day	1	1	1	1	a
MF 729	2 oz	21 day	1	1	1	1	a
MF 690	1 oz	14 day	1	1	1	1	a
MP 690	2 oz	14 day	1	1	1	1	a

Treatment	Rate/1000 ft2	Interval	Rep.1	Rep.2	Rep.3	Ave	DMR
MF 745	1 oz	21 day	1	1	1	1	a
MF 745	2 oz	14 day	1	1	1	1	a
MF 745	2 oz	21 day	1	1	1	1	a
Bayleton	1 oz	21 day	1	1	1	1	a
Tersan 1991	1 oz	21 day	1	1	1	1	a
Tersan 1991	2 oz	21 day	1	1	1	1	a
Cleary 3336	1 oz	21 day	1	1	1	1	a
Fungo 50	1 oz	21 day	1	1	1	1	a
Fungo 50	2 oz	21 day	1	1	1	1	a
S-1446	1.4 fl oz	14 day	2	1	1	1.3	a
Bayleton	1 oz	28 day	2	1	1	1.3	a
Bayleton + CH 26019 WP	1 oz + .75 oz ai.	28 day	2	1	1	1.3	a
PP 450	2 gm ai.	21 day	2	1	1	1.3	a
Chipco 26019 FL	1 oz ai.	21 day	1	1	2	1.3	a
Vorlan	1 oz	21 day	2	1	1	1.3	a
MF 729	1 oz	14 day	1	1	2	1.3	a
MF 745	1 oz	14 day	1	1	2	1.3	a
Cleary's 3336	2 oz	21 day	1	1	2	1.3	a
S-1555	9 fl oz	21 day	3	1	1	1.7	a
Prochloraz EC	4.5 fl oz	21 day	2	2	1	1.7	a
Lesco 63539	3 fl oz	14 day	2	2	1	1.7	a
Prochloraz EC	6 fl oz	21 day	1	3	1	1.7	a
Prochloraz EC + AD-TGF	4.5 fl oz + .34 oz	21 day	1	3	1	1.7	a
S-1555	6 fl oz	21 day	3	1	2	2	ab
Bayleton	.5 oz	21 day	2	2	2	2	ab
MF 729	1 oz	21 day	3	2	1	2	ab
Prochloraz EC + AD-TGF	3 fl oz + .34 oz	21 day	2	3	2	2.3	abc
MF 690	1 oz	21 day	3	2	2	2.3	abc
Chipco 26019 WP	1 oz ai	21 day	2	1	6	3	bc
CGA 449	24 gm ai.	21 day	5	2	3	3.3	cd
Actidione TGF (AD-TGF)	1 oz	21 day	5	5	3	4.3	d
CGA 449	8 gm ai.	21 day	7	5	5	5.7	e
CGA 449	12 gm ai	21 day	8	7	4	6.3	e
CGA 449	6 gm ai	21 day	7	7	6	6.7	e
Check	-	-	7	6	7	6.7	e

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

SDS BIOTECH FAIRWAY DISEASE CONTROL STUDIES - 1985

These studies (six treatments each) involved the application of fungicides (as shown below) on a 10 day spray schedule for the control of turf diseases which might appear on golf course fairways. The study was set out in four different locations on three different turfgrass varieties in an effort to collect data on as many turf diseases as possible. Two studies were conducted at the Hancock Turfgrass Research Center, one on annual bluegrass and one on perennial ryegrass. In these studies, we anticipated dollar spot, anthracnose, red thread, pythium and brown patch. A third study was conducted at the Glen Gary Golf course in Holland, Ohio on an annual bluegrass fairway which is generally severly damaged by anthracnose, dollar spot, brown patch and Pythium disease. The fourth study was located on a bentgrass green on the Raisin River golf course in Monroe, MI, where brown patch is frequently a problem. All studies were initiated during the first week of June, prior to disease outbreak. Treatments were re-applied every 10 days for a period of 120 days (4 applications per cycle for 3 cycles). The application sequence for one such cycle is detailed below. All studies were set up in three replications of a randomized block design utilizing a 6' x 9' plot size on all locations except the bentgrass green where a 3' x 6' plot size was used. Treatments were applied foliarly with a CO_2 small plot sprayer at 30 PSI and 48 gal/A. The following spray schedule was used:

Cycle #1 (four applications at 10 day intervals)

Day 1 applications:

Treatment #1 (Dac. 2787 + Tersan 1991, 1.5 fl oz + .5 oz per 1000 ft2)
Treatment #2 (Dac. 2787 3 fl oz per 1000 ft2)
Treatment #3 (Tersan 1991, .5 oz per 1000 ft2)
Treatment #4 (Dac. 2787, 1.5 fl oz per 1000 ft2)
Treatment #5 (Control)

Day 10 applications:

Treatment #1 (Dac. 2787 + Tersan 1991, 1.5 fl oz + .5 oz per 1000 ft2)
Treatment #2 (Dac. 2787, 3 fl oz per 10U0 ft2)
Treatment #3 (Tersan 1991, .5 oz per 1000 ft2)
Treatment #4 (Dac. 2787, 1.5 fl oz per 1000 ft2)

Day 20 applications:

Treatment #1 Variation #1 (Dac. 2787 + Bayleton, 1.5 fl oz + 1 oz per 1000 ft2)
Treatment #2 (Dac. 2787, 3 fl oz per 1000 ft2)
Treatment #4 (Dac. 2787, 1.5 fl oz per 1000 ft2)
Treatment #6 (Bayleton, 1 oz per 1000 ft2)

Day 30 applications:

Treatment #1 Variation #2 (Dac. 2787, 2 fl oz per 1000 ft 2)
Treatment #2 (Dac. 2787 3 fl oz per 1000 ft2)

Cycle #2 (four applications at 10 day intervals)

Day 40 applications: Same as day #1 applications
Day 50 applications: Same as day #10 applications
Etc., through 3 complete cycles.

By the end of the 120 day application period, treatments #1 (including variations) and #2 had been applied 12 times, treatment #3 had been applied 6 times, treatment #4 had been applied 9 times and treatment #6 had been applied three times on all 4 locations.

Data was taken for any diseases which appeared on the studies and the results are summarized below.

Location #1 (annual bluegrass, Hancock Turfgrass Rearch Center, MSU, E. Lansing, MI.)

Dollar Spot (Sclerotinia homoeocarpa) rating of 9/24/85
Rating scale: 1(no disease) - 9(90% infection or greater)

Treatment No.	Rep.I	Rep.II	Rep.III	Ave.	DMR*
1 (variable applications)	1	1	1	1	a
2 (Dac. 2787, 3 fl oz)	1	1	1	1	a
4 (Dac. 2787, 1.5 fl oz)	1	1	1	1	a
6 (Bayleton, 1 oz)	1	1	1	1	a
3 (Tersan 1991 .5 oz)	3	6	2	3.7	b
5 (Control)	5	4	2	3.7	b

* Treatments followed by the same letter(s) are not significantly diferent from each other at the 5% level.

Laboratory examination revealed that the Hancock Research Center dollar spot organisms are moderately benzimidazole resistant. This may accout for the poor performance of Tersan 1991 in the above test.

We had hoped to obtain an anthracnose rating from this study as well, but due to the cool summer we experienced, the disease never developed in the plot area.

Location #2 (Loretta perennial ryegrass, Hancock Turfgrass Research Center, MSU, E. Lansing, MI)

Red Thread (Laetisaria fuciformis) rating of 8/27/85
Rating scale: percent plot area infected

Treatment No.	Rep.I	Rep.II	Rep.III	Ave.	DMR*
1 (variable applications)	0	0	0	0	a
2 (Dac. 2787, 3 fl oz)	0	0	0	0	a
6 (Bayleton, 1 oz)	0	0	0	0	a
4 (Dac. 2787, 1.5 fl oz)	0	5	10	5	ab
3 (Tersan 1991, .5 oz)	5	5	10	6.7	b
5 (Control)	0	10	10	6.7	b

*Treatments followed by the same letter(s) are not significantly different from each other at the 5% level.

The ryegrass study was fertilized heavily during the summer months to encourage the development of brown patch and pythium, however, the cool weather prevented the occurrence of either disease.

Location #3 (annual bluegrass fairway, Glen Gary Golf Club, Holland, Ohio)

Dollar Spot (Moellerodiscus sp., Lanzia sp.) rating of 8/28/85
Rating scale: 1(no disease) - 9(90% infection or greater)

Treatment No.	Rep.I	Rep.II	Rep.III	Ave.	DMR*
1 (variable applications)	1	1	1	1	a
2 (Dac. 2787, 3 fl oz)	1	1	1	1	a
6 (Bayleton 1 oz)	1	2	2	1.7	ab
4 (Dac. 2787, 1.5 fl oz)	2	4	6	4	ab
5 (Control)	2	8	4	4.7	ab
3 (Tersan 1991, .5 oz.)	6	2	8	5.3	b

* Treatments followed by same letter(s) are not significantly different from each other at 5% level.

The dollar spot organisms in the Glen Gary study were shown to be benzimidazole-resistant in laboratory bio-assay analysis.

Anthracnose (colletotrichum graminicola) rating of 8/28/85
Rating scale: percent plot area infected.

Treatment No.	Rep.I	Rep.II	Rep.III	Ave.	DMR*
6 (Bayleton, 1 oz)	0	0	0	0	a
2 (Dac. 2787, 3 fl oz)	5	0	0	1.7	ab
1 (variable applications)	5	5	0	3.3	ab
3 (Tersan 1991, .5 oz)	5	5	5	5	ab
4 (Dac. 2787, 1.5 fl oz)	0	0	15	5	ab
5 (Control)	6	2	8	5.3	b

* Treatments followed by same letter(s) are not significantly different from each other at 5% level.

Location 4 (creeping bentgrass green, Raisin River Golf Club, Monroe, MI)

Brown Patch (Rhizoctonia solani) rating of 8/26/85
Rating scale: number of patches per plot

Treatment No.	Rep.I	Rep.II	Rep.III	Ave.	DMR*
1 (Variable applications)	0	0	0	0	a
2 (Dac. 2787, 3 fl oz)	0	0	0	0	a
4 (Dac. 2787, 1.5 fl oz)	0	0	0	0	a
6 (Bayleton, 1 oz)	0	0	0	0	a
3 (Tersan 1991, .5 oz.)	1	0	0	0.3	a
5 Control	1	2	1	1.3	b

* Treatments followed by the same letter(s) are not significantly different at the 5 % level.

In general, we experienced less disease in these 4 studies than we anticipated which we attribute to an unusually cool and moist summer in Michigan.

BAY POINTE BACTERIAL WILT STUDY - 1985

Three bacterial wilt (Xanthomonas campestris) studies were attempted this year on C-15 (Toronto) creeping bentgrass greens on a number of golf courses in southern Michigan. The only study in which disease pressure persisted long enough to get a control rating was located on the Bay Pointe Golf Club in Union Lake, MI.

Treatments were applied curatively on August 28 to three replicates of 3' x 6' plots in a random block design. The experimental compound was applied foliarly using a C02 small-plot sprayer at 30 PSI and 48 gal/A. The Mycoshield antibiotic was applied as a 50 gal/1000 ft2 soil drench. The treatments were re-applied on September 27 and on October 25. The plots were rated on Nov. 11.

Though Mycoshield is our standard recommendation for control of bacterial wilt and generally performs well, it seemed to be very slow-acting in this study. Consequently, when the season ended, the recovery within the Mycoshield plots was far from complete. Both of the compounds tested, however, gave significant control over the untreated plots.

Bay Pointe Bacterial Wilt Study 1985
Bay Pointe Golf Club, West Bloomfield, Michigan
Disease Rating: 1(no disease) - 9(90% infection or greater)
Plots Rated: 11/11/85

Treatment No.	Rate/1000 ft2	Rep.I	Rep.II	Rep.III	Ave.	DMR*
CGA-115944	9.4 gm.	4	5	6	5	a
CGA-115944	18.8 gm.	5	5	5	5	a
Mycoshield	2.5 lbs.	4	6	6	5.3	a
Check	-	7	7	8	7.3	b

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

LESCO RYEGRASS DISEASE CONTROL STUDY - 1985
Hancock Turfgrass Research Center
MSU, E. Lansing, MI

In addition to their inclusion in our dollar spot and anthracnose studies, the Lesco Corp. experimental fungicide compounds were applied to Loretta perennial ryegrass at the Hancock Center on the MSU campus. As a result of this effort, we obtained some excellent red thread (Laetisaria fuciformis) data which appears below.

Treatments were applied to 3 replicates of 6' x 9' plots in a random block design. Applications were made foliarly and preventively using a C02 small-plot sprayer at a volume of 48 gal/acre and 30 PSI. The first

application was made on July 1 with subsequent applications being made at 14 and 21 day intervals through Oct. 7.

Red Thread disease rating taken 8/27/85
Rating scale - percent plot area infected

Treatment	Rate/1000 ft2	Interval	Rep.I	Rep.II	Rep.III	Ave.	DMR*
Lesco 0585	2.5 oz	21 day	0	0	0	0	a
Lesco 0585	4 oz	21 day	0	0	0	0	a
Lesco 63539	6 fl oz	14 day	20	5	10	11.7	b
Lesco 63539	3 fl oz	14 day	15	20	5	13.3	b
Control	-	-	35	30	40	35	c

* Treatments followed by the same letter(s) are not significantly different from each other at the 5% level.

NECROTIC RING SPOT/SUMMER PATCH FUNGICIDE STUDIES - 1985

Fungicide trials were conducted on a residential condominium site in Novi, MI, which has a history of severe necrotic ring spot (Leptosphaeria korrae). The study was rated when the initial treatments were applied in mid-September. Treatments were re-applied monthly through mid-November at which time a second disease rating was taken. The post-treatment rating showed a general improvement in the entire plot area (including controls) and there was little evidence of disease activity during the time of the year when we normally expect to see renewed disease activity (fall). Therefore, no disease control data was obtained from this study.

A fungicide trial was also conducted on a summer patch (Phialophora graminicola) infected annual bluegrass fairway at the Orchard Lake Country Club in Orchard Lake, MI. This location had experienced a severe summer patch outbreak in the extraordinarily hot summer of 1983. The applications were made monthly beginning in June and continuing through September. Because we had an unusually cool summer, however, no summer patch appeared in the plot area this year.

W.A. CLEARY CHEMICAL CORP. BROMOSAN F NECROTIC RING SPOT STUDY

This study was designed to evaluate Bromosan F and its two components (Cleary's 3336 and thiram) for the control of necrotic ring spot (Leptosphaeria korrae) on bluegrass. The treatments were applied monthly from late June through late October. The plot area showed evidence of extensive disease activity (patches) from last year, but it was located at the same site as the necrotic ring spot study described above and, therefore, no new disease activity occurred this season and no data was obtained.

DOLLAR SPOT/SUMMER PATCH FAIRWAY STUDY - 1985
Orchard Lake Country Club, Orchard Lake, MI

This fairway (Poa annua) fungicide study was established on a moderately fertilized, irrigated fairway area which had been infected with summer patch in

previous summers. The study was set up in three replications of a random block design with a 6' x 9' plot size. All liquid treatments were applied with a CO_2 small plot sprayer at 30 PSI and 48 gal/acre. The granular formulations were pre-weighed and applied by hand. The area was not otherwise fertilized or sprayed during the season and it was regularly mowed at 1/2".

Initial applications were made on June 19 with subsequent applications being made on a monthly basis in July and August (except as noted on data table). Summer patch never developed in the study this season because of the cool, moist summer we experienced. We did, however, have a good outbreak of dollar spot (Moellerodiscus sp., Lanzia sp.) in September and the following rating was taken on September 27, approximately 6 weeks after the last applications were made.

The dollar spot fungal strains on this golf course were tested and shown to be resistant to the benzimidazole fungicides (Tersan 1991, Fungo 50, Clearys 3336).

This explains the failure of these compounds to control dollar spot in this study.

DOLLAR SPOT/SUMMER PATCH FAIRWAY STUDY - 1985
Orchard Lake Country Club, Orchard Lake, Michigan

Dollar Spot rating: 1(no disease) - 9(908 infection or greater)
Disease rated: 9/27/85

Treatment	Rate/1000 ft2	Interval	RepI	RepII	RepIII	Ave.	DMR
Lawnkeeper	10 lbs	30 Day	1	1	1	1	a
Green Magic	1.89 L	30 Day	1	1	1	1	a
Bayleton	2 oz	30 Day	1	1	1	1	a
Bayleton	4 oz	30 Day	1	1	1	1	a
Banner	2 oz	30 Day	1	1	1	1	a
Banner	4 oz	30 Day	1	1	1	1	a
Vorlan	4 oz	30 Day	1	1	1	1	a
Rubigan	2 oz	30 Day	1	1	1	1	a
Rubigan	4 oz	30 Day	1	1	1	1	a
Vorlan	2 oz	30 Day	2	2	1	1.3	ab
C-50	8 lbs	30 Day	1	1	2	1.3	ab
Urea	1 lb	30 Day	2	3	1	2	abc
Chipco 26019	4 oz	30 Day	2	2	3	2.3	abcd
Chipco 26019	2 oz	30 Day	1	6	1	2.7	abcde
Sulfer Fl	1 lb	30 Day	6	1	3	3.3	abcde
Tersan 1991	4 oz	30 Day	1	6	4	3.7	bcdef
Phosphorus	2 lbs	30 Day	1	6	4	3.7	bcdef
Tersan 1991	2 q	30 Day	4	7	2	4.3	cdefg
Phosphorus	3 lbs	June only	4	4	5	4.3	cdefg
Cleary's 3336	4 oz	30 Day	4	6	4	4.7	defg
Phosphorus	1 lb	June only	7	4	3	4.7	defg
Cleary's 3336	2 oz	30 Day	6	5	4	5.0	efgh

Treatment	Rate/1000 ft2	Interval	RepI	RepII	RepIII	Ave.	DMR
Control	-	-	7	5	6	6.0	fgh
Fungo 50	2 oz	30 Day	6	6	7	6.3	gh
Fungo 50	4 oz	30 Day	7	7	7	7	h

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

Fungicide Active Ingredient

Acti-dione TGF - 2.1% W; Banner - 1.1 E; BAS 45406F - 25% E; Bayleton - 25% DP; BRC 916 - 12% F; Bromosan F i- 45% F; Caddy - 20.1% F; Cad-trete Granular Fungicide - 2.88% G; Calo-clor-90% W; Calo-Gran - 2.7% G; CGA-115944 - 50% W; CGA-449 - 50% W; Chipco 26019 Fl - 2 F; Chipco 26019 WP - 50% W; Clearspray - sticker; Cleary Granular fungicide - 5.75% G; Clearys 3336 - 50% W; Daconil 2787 - 40.4% F; DPX-H6573 - 40%E; DPX-965 - 75% W Duosan - 60% W; Dyrene - 4 F; Fungo - 50% W; HWG 0519 - 25 % DF; HWG 1608 - 1.2E; Lesco 0585 - 65% W; Lesco 63539 - 5F; S-1555 - proprietary information; Scotts F+ F II - 14-3-3 fert., 15.4% G; SN 84364 - 50% W; Spotrete F - 42% P; Spotrete WP - 75% W; Sulfur F - 52% F; Tersan 1991 - 50% W; Urea - 46-0-0 fert.; Vorlan - 50% W; XE 779 - 25% W.