

TURFGRASS FUNGICIDE RESEARCH REPORT - 1978

J. M. Vargas, Jr., and R. Detweiler
Department of Botany and Plant Pathology
Michigan State University

Snow Mold Fungicide - Fertility Trials - 1977-78 Boyne Highlands
Resorts, Harbor Springs, Michigan

Establishment:

The 1978 Typhula snow mold fungicide - fertility trials were conducted at the Boyne Highlands Resort, Harbor Springs, MI on 'Penncross' creeping bentgrass mowed at 1/2 inch. Treatments were applied to 6' x 9' plots in three repetitions of a random block design on November 1, 1977. The wettable powders and flowables were applied with a small-plot CO₂ sprayer at a volume of 40 gal/acre. The granular fungicide and fertilizer applications were made with a 3 ft Scotts drop-type spreader. The plot ratings were taken on April 17, 1978.

Results:

The predominant snow mold present was Typhula blight caused by Typhula incarnata. A small amount of Fusarium patch was present and is so indicated in the tables. The most effective treatments were Calo-Gran 6 lbs., Calo Clor 3 oz., Daconil 2787 8 oz + RP 26019 4 oz., Daconil 2787 8 oz. + RP 26019 8 oz., Daconil 2787 16 oz., Daconil 2787 4 oz. + RP 26019 8 oz., and Scotts F + FII 1 x rate. While the table would indicate that most of the control coming from the Daconil 2787 + RP 26019 combination was due to the Daconil 2787, the combination did in some cases improve the efficacy of Daconil 2787.

This years results were comparable to the 1975-76 season when Calo-Clor, Calo Gran and Daconil 2787 fungicides were the best products. The PCNB products, Scotts F + FII, and Terraclor gave significant control compared to the untreated check but not as good as other seasons. The chloroneb product, Tersan SP, also gave significant control compared to the untreated check, but certainly not acceptable control from a practical point of view. The reason for the increase in the amount of snow mold present in 1975-76 and this season in PCNB and chloroneb treatments is not known.

Percent Typhula blight, except where otherwise indicated, on Penncross creeping bentgrass at Boyne Highlands Resort, Harbor Springs, Mi.

Treatment	Rate/1000 ft ²	Repetition			AVE	DMR ^b
		I	II	III		
Calo Gran	6 lbs.	2	0	0	.7	A
Calo Clor	3 oz.	5	1	10	5.3	A
Daconil 2787 + Rp 26019	8 oz. + 4 oz.	1	10 ^a	5	5.3	A
Daconil 2787 + Rp 26019	8 oz. + 8 oz.	15 ^a	2	20	12.3	AB
Daconil 2787	16 oz.	20 ^a	20	10 ^a	16.7	ABC
Daconil 2787 + Rp 26019	4 oz. + 8 oz.	20	7 ^a	30 ^a	19	ABC
Scotts F + F II	1X	20	30	20	23.3	ABC
Daconil 2787	8 oz.	30 ^a	30	30	30	BCD
Daconil 2787 + Rp 26019	4 oz. + 4 oz.	40	20 ^a	40 ^a	33.3	BCD
Daconil 2787	4 oz.	30 ^a	25 ^a	60	38.3	CDE
Terraclor (wp)	8 oz.	50	70	30	50	DEF
Acti-dione RZ	8 oz.	50	60	65	58.3	EFG
Terraclor (GR)	7.5lbs.	60	50	70	60	EFG
Rp 26019	16 oz.	50	60	95	68.3	FGH
Tersan SP	9 oz.	80	40 ^a	90	70	FGHI
Calo Clor + Terraclor (wp)	1 oz. + 2 oz.	80	50	85	71.1	FGHIJ
Calo Clor	1 oz.	100	40	80	73.3	FGHIJ
BFN 7544	10 fl oz.	100	40	90	76.7	GHIJ
GA-1-105	2.5 gm. ai.	80	60 ^a	100	80	GHIJ
Rp 26019	4 oz.	70	75	100	81.7	GHIJ
GA-1-105	5 gm. ai.	90	80	80	83.3	GHIJ
Tersan SP + Calo Clor	3 oz. + 1 oz.	95	60	95	83.3	GHIJ
Rp 26019	8 oz.	80	95	100	91.7	IJJ
Tersan SP + Terraclor (wp)	3 oz. + 2 oz.	90 ^a	90	100	93.3	IJJ
DPX 4424	4 oz.	95	95	95	95	IJ
Terraclor (wp)	2 oz.	100	90	95	95	IJ
DPX 4424	8 oz.	95	95	100	96.7	J
BFN 7544	5 fl. oz.	95	95	100	96.7	J
Tersan SP	3 oz.	95	95	100	96.7	J
Check	--	95 ^a	95 ^a	100	96.7	J

^a - represents the following percent Fusarium patch included in total number: Dac. + Rp. 8 oz. + 4 oz. - 5%; Dac. + Rp. 8 oz. + 8 oz. - 5%; Dac. 16 oz. - 15% + 2% respectively; Dac. + Rp. 4 oz. + 8 oz. - 2% + 15% respectively; Dac. 8 oz. - 5%; Dac. + Rp. 4 oz. + 4 oz. - 2% + 5% respectively; Dac. 4 oz. - 5% + 10% respectively; Tersan SP 9 oz. - 15%; GA-1-105, 2.5 gm ai - 5%; Ter. SP + Terr. 3 oz. + 2 oz. - 10%; check 2% + 15% respectively

^b - treatments followed by same letter are not significantly different at 5% level.

Plum Hollow Snow Mold Fungicide Report - 1977-78, Plum Hollow Golf Course, Livonia, MI. 48150

Establishment:

This snow mold study was established at Plum Hollow Golf Course on a Poa annua fairway maintained at about 1/2" height of cut. Treatments were applied to 6' x 9' plots in three repetitions of a random block design on November 14, 1977. The wettable powders and flowables were applied with a small-plot CO₂ sprayer at a volume of 40 gal/acre. The granular fungicide applications were made with a 3' Scotts drop-type spreader. The readings were taken on March 22, 1978.

Results:

The results in this study are somewhat inconclusive due to a lack of severe disease pressure. The predominant disease was pink snow mold (Fusarium nivale), although a good deal of gray snow mold (Typhula incarnata) was present in certain plots.

Plum Hollow Snow Mold Studies % area infested with pink snow mold, except where otherwise indicated

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>AVE</u>	<u>DMR</u>
Daconil 2787	8 oz.	2	2	1	1.67	A
Terraclor (GR)	7.5 lbs.	5	0	2	2.33	A
Tersan SP + Tersan 1991	9 oz. + 6 oz.	5	5	2	4.0	A
Terraclor (wp)	8 oz.	2	2	10	4.67	A
Daconil 2787	4 oz.	5	10	0	5.0	A
Scts. F + F II	1 X	1	2	15	6.0	A
BFN 7544	5 fl. oz.	10	5	5	6.67	AB
Rp 26019	8 oz.	12	8	0	6.67	AB
Daconil 2787	2 oz.	15	5	2	7.33	AB
Calo-Clor	3 oz.	15	5	2	7.33	AB
Tersan SP	9 oz.	5	15	5	8.33	AB
Daconil 2787 + Rp 26019	2 oz. + 4 oz.	20	3	2	8.33	AB
Calo-Gran	6 lbs.	5	20	2	9.0	AB
Tersan SP	6 oz.	5	25	2	10.67	AB
GA-1-105	5 gm ai	25	5	5	11.67	AB
Bromosan	6 oz.	5	20	10	11.67	AB
Rp 26019	4 oz.	30	0	5	11.67	AB
Check	--	5	20	10	11.67	AB
Daconil 2787 + Rp 2619	4 oz + 8 oz.	25	7	5	12.33	AB
Daconil 2787 + Rp 2619	2 oz. + 8 oz.	25	0	12	12.33	AB
DPX 4424	8 oz.	25	5	10	13.33	AB
DPX 4424	4 oz.	20	10	10	13.33	AB
Daconil 2787 + Rp 26019	4 oz. + 2 oz.	40	1	0	13.67	AB
Daconil 2787 + Rp 26019	2 oz. + 2 oz.	25	10	10	15.0	AB
Tersan 1991	6 oz.	7	35	5	15	AB
Rp 26019	2 oz.	45	1	1	15.67	AB
Daconil 2787 + Rp 26019	8 oz. + 2 oz.	35	15	5	18.33	ABC
Daconil 2787 + Rp 26019	4 oz. + 4 oz.	25	15	15	18.33	ABC
BFN 7544	10 fl oz.	20	20	15	18.33	ABC
Daconil 2787 + Rp 26019	8 oz. + 4 oz.	45	15	3	21.0	ABC
GA-1-105	2.5 gm ai	40	10	15	21.67	ABC
Daconil 2787 + Rp 26019	8 oz. + 8 oz.	75	3	0	26.0	ABC
Acti-dione - Thiram	8 oz.	75	10	10	31.67	BC
Acti-dione - RZ	8 oz.	50 ^a	50 ^a	20	40.0	C
Acti-dione - TGF	8 oz..	50 ^a	90 ^a	25	55.0	C

^a -plots infected primarily with gray snow mold

^b -treatments followed by same letter are not significantly different from each other at the 5% level.

Helminthosporium (Melting-Out) study - 1978

The 1978 Helminthosporium vagans (melting-out) fungicide trials were conducted at the MSU soils research farm on Park Kentucky bluegrass maintained at a 1½" height of cut. Fungicide treatments were applied on a bi-weekly schedule on May 3, May 18 and May 31, except as noted on the data charts. All liquid and wettable powder formulations were applied with a CO₂ small plot sprayer at a volume of 40 gal/acre. The granular formulations were applied with a 3' Scotts drop-type spreader.

The plots were 3' x 6' and were replicated three times in a randomized block design. The plots were rated on June 15.

HELMINTHOSPORIUM LEAF SPOT STUDY RATINGS
 MSU SOILS FARM - 6/15/78
 QUALITY RATINGS - 1, best - 9, worst

Treatment	Rate/1000 ft ²	Repetition			AVE	DMR
		I	II	III		
Lesco 2887	3 oz	3	3	2	2.7	A
DPX 4424	2 oz (ai)	3	2	3	2.7	A
DPX 4424 + Tersan 75	.5 oz (ai) + 3 oz	3	2	3	2.7	A
DPX 4424 + Tersan 1991	1 oz (ai) + 1 oz	2	2	5	3	AB
Lesco 2887	2 oz	3	2	5	3.3	ABC
DPX 4424	1 oz (ai)	3	2	5	3.3	ABC
Dac. 2787-WP	4 oz	2	5	4	3.7	ABCD
Rp 26019	1 oz (ai)	3	6	3	4	ABCD
Dac. 2787-500 F1	6 fl oz	4	6	2	4	ABCD
BFN 8090	1 oz	2	5	5	4	ABCD
BFN 8077	1 fl oz	6	3	3	4	ABCD
BFN 8077	4 fl oz	4	4	4	4	ABCD
Rp 26019	.5 oz (ai)	4	5	4	4.3	ABCDE
DPX 4424	.5 oz (ai)	3	5	5	4.3	ABCDE
Tersan 1991	1 oz	2	5	6	4.3	ABCDE
Dac. 2787-6F	6 fl oz	2	5	6	4.3	ABCDE
Dac. 2787-500 F1	3 fl oz	3	6	4	4.3	ABCDE
Dac. 2787-WP	2 oz	3	4	6	4.3	ABCDE
Acti-dione TGF	.34 oz	5	4	5	4.7	ABCDEF
BFN 7789	1 fl oz	6	3	5	4.7	ABCDEF
Acti-dione TGF	.69 oz	4	5	6	5	ABCDEF
Acti-dione Plus	.69 oz	8	5	2	5	ABCDEF
Rp 26019	.75 oz (ai)	7	4	5	5.3	ABCDEF
Acti-dione Plus	.34 oz	6	6	4	5.3	ABCDEF
DPX 4424 + Tersan 75	1 oz (ai) + 3 oz	3	8	5	5.3	ABCDEF
GA-64251 (EC)	8 gm (ai)	7	4	5	5.3	ABCDEF
BFN 8006 (GR)	4 lbs	4	6	6	5.3	ABCDEF
Dac. 2787 - 6F	3 fl oz	5	6	6	5.7	ABCDEF
BFN 8090	4 oz	5	7	5	5.7	ABCDEF
BFN 7789	4 fl oz	4	8	5	5.7	ABCDEF
BFN 8006 (GR)	2 lbs	4	7	6	5.7	ABCDEF
Bromosan - FL ^a	4 fl oz	9	4	5	6	BCDEF
BFN 8077	2 fl oz	4	8	6	6	BCDEF
Check	-	4	7	7	6	BCDEF
GA-64251 (EC)	12 gm (ai)	7	6	6	6.3	CDEF
BFN 8090	2 oz	7	6	6	6.3	CDEF
Bromosan WP	3 oz	8	7	5	6.7	DEF
Caddy ^b + Bromosan-FL ^a	1 fl oz + 4 fl oz	9	6	7	7.3	EF
Caddy ^b	1 fl oz	8	7	8	7.7	F

^a These materials applied only once prior to ratings.

^b This material " " twice prior to ratings.

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

HELMINTHOSPORIUM LEAF SPOT STUDY RATINGS
 MSU SOILS FARM - 6/15/78
 DISEASE RATING - 1, least disease, 9, most disease

Treatment	Rate/1000 ft ²	Repetition			AVE.	DMR
		I	II	III		
DPX 4424	1 oz (ai)	1	1	1	1	A
Dac. 2787 - WP	4 oz	1	1	1	1	A
DPX 4424 + Tersan 1991	1 oz (ai) + 1 oz	1	1	1	1	A
Rp 26019	.5 oz (ai)	1	2	1	1.3	AB
DPX 4424	2 oz (ai)	1	2	1	1.3	AB
DPX 4424	.5 oz (ai)	1	2	2	1.7	AB
DPX 4424 + Tersan 75	.5 oz (ai) + 3 oz	1	1	3	1.7	AB
Dac. 2787 - WP	2 oz	3	1	1	1.7	AB
BFN 8077	4 fl oz	2	2	1	1.7	AB
Rp 26019	1 oz (ai)	1	2	3	2	ABC
DPX 4424 + Tersan 75	1 oz (ai) + 3 oz	1	3	2	2	ABC
GA - 64251 (EC)	12 gm (ai)	3	2	1	2	ABC
BFN 7789	4 fl oz	1	4	1	2	ABC
Lesco 2887	2 oz	1	1	5	2.3	ABCD
Acti-dione TGF	.69 oz	1	2	5	2.7	ABCD
Rp 26019	.75 oz (ai)	2	3	4	3	ABCDE
Dac. 2787 - 6F	6 fl oz	4	4	1	3	ABCDE
Lesco 2887	3 oz	1	5	4	3.3	ABCDEF
Dac. 2787 - 500 F1	6 fl oz	2	5	3	3.3	ABCDEF
BFN 8090	1 oz	4	4	2	3.3	ABCDEF
BFN 7789	2 fl oz	2	2	6	3.3	ABCDEF
BFN 8090	4 oz	3	6	2	3.7	ABCDEFG
BFN 8077	2 fl oz	1	3	8	4	ABCDEFG
Bromosan WP	3 oz	6	4	3	4.3	ABCDEFGH
GA - 64251 (EC)	8 gm (ai)	5	2	7	4.7	BCDEFGHI
BFN 8077	1 fl oz	6	2	6	4.7	BCDEFGHI
BFN 7789	1 fl oz	5	7	2	4.7	BCDEFGHI
Bromosan FL ^a	4 fl oz	9	2	5	5.3	CDEFGHI
Dac. 2787 - 6F	3 fl oz	7	7	3	5.7	DEFGHI
BFN 8006 - GR	4 lbs	6	6	5	5.7	DEFGHI
BFN 8090	2 oz	8	7	4	6.3	EFGHI
Acti-dione TGF	.34 oz	8	4	8	6.7	FGCH
Acti-dione Plus	.34 oz	7	8	5	6.7	FGHI
BFN 8006 - GR	2 lbs	6	7	7	6.7	FGHI
Acti-dione Plus	.69 oz	9	9	3	7	GHI
Check	-	8	6	7	7	GHI
Caddy + Bromosan - FL ^a	1 fl oz + 4 fl oz	6	8	9	7.7	HI
Dac. 2787 - 500 FL	3 fl oz	7	8	8	7.7	HI
Caddy ^b	1 fl oz	9	7	8	8	I
Tersan 1991	1 oz	7	9	8	8	I

^a These materials applied only once prior to ratings.

^b This material applied twice only prior to ratings.

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

Results: Helminthosporium melting-out

The following treatments all gave significant control of Helminthosporium melting-out when compared to the untreated control: DPX 4424, .5 oz ai, 1 oz ai, 2 oz ai; DPX 4424 1 oz ai + Tersan 1991 1 oz; DPX 4424 .5 oz ai + Tersan 75 3 oz; DPX 4424 1 oz ai + Tersan 75 3 oz; Daconil 2787 (WP) 4 oz, 2 oz; Daconil 2787 (6F) 6 fl oz; Daconil 2787 (500 FL) 6 fl oz; Rp 26019 .5 oz ai, .75 oz ai, 1 oz ai; BFN 8077 4 fl oz; GA 64251 (EC) 12 gm ai; BFN 7789 2 fl oz, 4 fl oz; Acti-dione TGF .69 oz; Lesco 2887 2 oz, 3 oz; and BFN 8090 1 oz. There are several new fungicides with excellent potential for the control of Helminthosporium melting-out. These new materials, along with established materials like Daconil 2787 and Acti-dione TGF, should provide a good selection of Helminthosporium melting-out fungicides for the future.

Common Dollar Spot - Fungicide Study - 1978

The 1978 common (benzimidazole sensitive) dollar spot (Sclerotinia homeocarpa) study was conducted on a Poa annua fairway on the Burroughs Farms Golf Course, Brighton, Michigan. The 3' x 6' plots were laid out in three replications in a randomized block design. All liquid fungicide applications were made with a CO₂ small-plot sprayer at a volume of 40 gal/acre. All granular formulations were applied with a 3' Scotts drop-type spreader.

The dollar spot infestation was severe over the entire plot area prior to the first fungicide application on August 24. A second treatment was made on September 8, with the ratings being taken on September 20.

Common Dollarspot Fungicide Study - 1978
Disease Rating Scale - 1 (no disease) - 9 (severe disease)

Treatment	Rate/1000 ft ²	Plot disease ratings			AVE	(DMR)
		I	II	III		
Tersan 1991	1 oz	1	1	1	1	A
Fungo 50	1 oz	1	1	1	1	A
Cleary 3336	1 oz	1	1	1	1	A
Cleary 3336-FL	1 fl oz	1	1	1	1	A
Spectro	3 oz	1	1	1	1	A
FDS Fert. 20-4-12+BRS Fung.	5.5 lbs	1	1	1	1	A
FDS Fert. + BRS Fung. 2X	5 lbs	1	1	1	1	A
FDS FERT. + BRS Fung. 1X	5.5 lbs	1	1	1	1	A
MF 598	4 oz	1	1	1	1	A
Kromad	4 oz	1	1	1	1	A
Daconil 2787-6F	6 fl oz	1	1	1	1	A
DPX 4424 + Tersan 1991	.5 oz ai + .5 oz	1	1	1	1	A
DPX 4424	2 oz ai	1	1	1	1	A
Lesco 2887	2 oz	1	1	1	1	A
Lesco 2887	3 oz	1	1	1	1	A
BFN 8090	10 oz	1	1	1	1	A
BFN 7789	5 fl oz	1	1	1	1	A
BFN 8077	5 fl oz	1	1	1	1	A
Bayleton - 25WP	.5 oz ai	1	1	1	1	A
Bayleton - 50WP	1 oz ai	1	1	2	1.3	AB
Bayleton - 25WP	1 oz ai	1	1	2	1.3	AB
BFN 7789	10 fl oz	1	2	1	1.3	AB
Bromosan WP	3 oz	1	1	2	1.3	AB
CGA-64251-EC	4 gm ai	1	1	2	1.3	AB
DPX 4424	1 oz ai	1	2	1	1.3	AB
DPX 4424 + Tersan 75	.5 oz ai + 3 oz	1	1	2	1.3	AB
DPX 4424 + Tersan 75	1 oz ai + 3 oz	2	1	1	1.3	AB
Daconil 2787 - WP	4 oz	2	1	1	1.3	AB
Bayleton 50WP	.5 oz ai	1	2	2	1.7	ABC
BFN 8077	10 fl oz	2	1	2	1.7	ABC
BFN 8090	5 oz	1	3	1	1.7	ABC
Bromosan FL	4 fl oz	1	2	2	1.7	ABC
Caddy	1 fl oz	1	2	2	1.7	ABC
Bromosan FL + Caddy	4 fl oz + 1 fl oz	2	1	2	1.7	ABC
DPX 4424	.5-oz ai	2	1	2	1.7	ABC
Rp 26019	1 oz	2	1	2	1.7	ABC
Acti-dione Plus	.69 oz	2	2	2	2	ABC
Acti-dione TGF + Fe SO ₄	.34 oz + .34 oz	2	3	1	2	ABC
Acti-dione TGF + Fe SO ₄	.69 oz + .69 oz	2	2	2	2	ABC
Daconil 2787 - 500 FL	6 fl oz	2	1	3	2	ABC
Rp 26019	.5 oz	2	3	1	2	ABC
Rp 26019	.75 oz	2	1	3	2	ABC
CGA-64251-EC	8 gm ai	2	2	3	2.3	ABC
LLSE	1:10 dilution	3	3	2	2.7	BC
Acti-dione TGF	.34 oz	4	2	2	2.7	BC
Acti-dione Plus	.34 oz	2	3	3	2.7	BC

Treatment	Rate/1000 ft ²	Plot disease ratings			AVE	(DMR)
		I	II	III		
Acti-dione TGF	.69 oz	3	2	4	3	C
LLSE	1:100 dilution	6	3	6	5	D
Aqua-Gro	8 fl oz	5*	3*	7*	5	D
Check	-	6	7	4	5.7	D

*phytotoxicity

NOTE: Treatments followed by same letter are not significantly different at 5% level.

Results: Common Dollarspot study

All treatments with the exception of Aqua-gro 8 fl oz and LLSE at the 1:100 dilution gave significant control when compared to the untreated control. The entire area had a rating of 8-9 when the study was initiated. The dollar spot was so severe that individual spots could not be counted so an estimated % disease was used.

Benzimidazole - Resistant Dollarspot Study - 1978

The benzimidazole - resistant dollarspot (*Sclerotinia homeocarpa*) study was conducted on a Toronto creeping bentgrass nursery at Maple Lanes Golf course in Warren, Michigan. The 3' x 6' plots were laid out in three replications in a randomized block design. All liquid treatments were applied with a small-plot CO₂ sprayer at a volume of 40 gal/acre. The granular formulations were applied with a Scotts - drop type spreader.

Treatments were applied to the plots on August 14, August 30 and September 15. The disease infestation had reached severe levels prior to the first application.

The ratings were taken on September 26.

Benzimidazole - Resistant Dollarspot Study - 1978
Disease rating scale: 1 (no disease) - 9 (severe disease)

Treatment	Rate/1000 ft ²	Plot disease rating			AVE	(DMR)
		I	II	III		
DPX 4424 + Tersan 75	1 oz ai + 3 oz	2	1	1	1.3	A
DPX 4424	1 oz ai	1	1	2	1.3	A
Daconil 2787 - 6F	6 fl oz	2	1	1	1.3	A
Bayleton - 25WP	1 oz ai	2	1	1	1.3	A
Daconil 2787 - WP	4 oz	1	2	2	1.7	AB
BFN 8006 - GR	10 lbs	2	1	2	1.7	AB
BFN 8090	10 oz	2	1	2	1.7	AB
Bayleton 50WP	1 oz ai	2	1	3	2	AB
BFN 8077	10 fl oz	2	2	2	2	AB
Rp 26019	1 oz	2	2	3	2.3	ABC
BFN 7789	1 fl oz	2	2	3	2.3	ABC
CGA-64251-EC	8 gm ai	2	2	3	2.3	ABC
Acti-dione Plus	2 oz	2	3	3	2.7	ABC
Daconil 2787 - 500 FL	6 fl oz	3	2	3	2.7	ABC
Acti-dione TGF + Fe SO ₄	2 oz + 2 oz	3	3	3	3	ABC
Lesco 2887	3 oz	5	3	3	3.7	BC
Acti-dione TGF	2 oz	4	3	6	4.3	C
Spectro	3 oz	3	7	3	4.3	C
FDS Fert. + BRS Fung. 2X	5 lbs	8	3	8	6.3	D
Check	-	8	6	7	7	DE
FDS Fert. + BRS Fung. 1X	5.5 lbs	8	6	7	7	DE
LLSE	1:150 dilution	7	7	8	7.3	DE
Cleary 3336 - WP	1 oz	7	8	7	7.3	DE
Kromad	4 oz	9	5	8	7.3	DE
Caddy	1 fl oz	8	9	5	7.3	DE
FDS Fert. 20-4-12 + BRS Fung.	5.5 lbs	8	6	9	7.7	DE
MF 598	4 oz	9	7	7	7.7	DE
Fungo 50	1 oz	9	7	7	7.7	DE
Tersan 75	3 oz	8	7	9	8	DE
Tersan 1991	1 oz	9	9	6	8	DE
Cleary 3336 - FL	1 fl oz	9	9	8	8.7	E
LLSE	1:75 dilution	8	9	9	8.7	E

NOTE: All treatments followed by the same letter are not significantly different at the 5% level.

Results: Benzimidazole Resistant Dollarspot

The following treatments all gave significant control when compared to the untreated control: Daconil 2787 (6F) 6 fl oz, Daconil 2787 (WP) 4 oz, Daconil 2787 (500 FL) 6 fl oz, DPX 4424 1 oz ai, DPX 4424 1 oz ai + Tersan 75 3 oz, Bayleton (25 WP) 1 oz ai, Bayleton (50 WP) 1 oz ai, BFN 8006 (GR) 10 lbs., BFN 8090 10 oz, BFN 8077 10 fl oz, Rp 26019 1 oz, BFN 7789 10 fl oz, CGA 64251 (EC) 8 gms ai, Acti-dione Plus 2 oz, Acti-dione TGF 2 oz + FeSO₄ 2 oz, Acti-dione TGF 2 oz, Lesco 2887 3 oz and Spectro 3 oz. As expected, the benzimidazole systemic fungicides did not control this strain of Sclerotinia homeocarpa.

Many benzimidazole - resistant strains of Sclerotinia homeocarpa are very vigorous and repeated applications are necessary to achieve control with the fungicides that are available at this time.

Anthracnose - Fungicide Study # 1 - 1978

The 1978 anthracnose (Colletotrichum graminicola) fungicide study #1 was conducted on the Bay Pointe Golf Club in West Bloomfield, Mi., on an irrigated annual bluegrass fairway maintained at a 1/2" height of cut. The plot was laid out in 3 replications in a randomized block design.

The liquid applications were made with a CO₂ small-plot sprayer at a volume of 40 gal/acre while the granular formulations were applied with a 3' Scotts drop-type spreader.

All treatments were applied to the plots on August 3 and August 17, except as noted on the data charts. The ratings were taken on August 31.

Anthracnose - Fungicide Study #1
 Bay Pointe Golf Course, Union Lake, MI
 % area diseased

Treatment	Rate/1000 ft ²	% anthracnose/plot			AVE	(DMR)
		I	II	III		
Lesco 2887	3 oz	0	0	5	1.7	A
FDS Fert. + BRS Fung. 2X	5 lbs	10	5	5	6.7	AB
FDS Fert. 20-4-12+BRS Fung.	5.5 lbs	5	10	5	6.7	AB
DPX 4424	1 oz ai	10	5	5	6.7	AB
DPX 4424	2 oz ai	2	5	15	7.3	ABC
Fungo 50	1 oz	20	0	5	8.3	ABCD
Lesco 2887	2 oz	2	5	20	9	ABCD
Tersan 1991	1 oz	2	2	25	9.7	ABCD
Rp 26019	.75 oz	0	8	25	11	ABCD
Acti-dione TGF	.34 oz	30	2	2	11.3	ABCD
Rp 26019	.5 oz	2	2	30	11.3	ABCD
BFN 8006*	5 lbs	5	10	20	11.7	ABCD
Caddy	1 fl oz	30	2	8	13.3	ABCDE
BFN 8077	10 fl oz	25	10	7	14	ABCDE
BFN 7789	5 fl oz	25	2	15	14	ABCDE
DPX 4424	.5 oz ai	25	10	10	15	ABCDE
BFN 8090	10 oz	10	35	5	16.7	ABCDE
Acti-dione Plus	.69 oz	20	5	25	16.7	ABCDE
Rp 26019	1 oz	5	8	40	17.7	ABCDE
Daconil 2787 - 500 FL	6 fl oz	20	8	25	17.7	ABCDE
Cleary 3336 - FL	1 fl oz	15	2	40	19	ABCDE
BFN 8077	5 fl oz	25	2	30	19	ABCDE
FDS Fert. + BRS Fung. 1X	5.5 lbs	20	25	15	20	ABCDE
Daconil 2787-6F	6 fl oz	40	5	15	20	ABCDE
Acti-dione Plus	.34 oz	30	5	30	21.7	ABCDE
LLSE	1:10 dilution	40	20	5	21.7	ABCDE
Bromosan WP	3 oz	40	0	30	23.3	ABCDE
Bayleton 50 WP	1 oz ai	20	20	30	23.3	ABCDE
CGA-64251-EC	4 gm ai	50	5	20	25	ABCDE
Acti-dione TGF	.69 oz	40	5	30	25	ABCDE
Check	-	20	10	50	26.7	ABCDE
Daconil 2787 - WP	4 oz	45	25	15	28.3	BCDE
BFN 7789	10 fl oz	30	20	35	28.3	BCDE
Bromosan - FL	4 fl oz	50	2	35	29	BCDE
CGA-64251-EC	8 gm ai	70	15	2	29	BCDE
Bromosan FL + Caddy	4 fl oz + 1 fl oz	30	35	25	30	BCDE
Kromad	4 oz	40	25	25	30	BCDE
LLSE	1:100 dilution	30	30	30	30	BCDE
MF 598	4 oz	25	40	30	31.7	BCDE
BFN 8006	10 lbs.	50	25	25	33.3	CDE
Cleary 3336 WP	1 oz	30	30	40	33.3	CDE
BFN 8090	5 oz	60	2	40	34	DE
Bayleton 25 WP	1 oz ai	45	40	30	38.3	E

*BFN 8006 applied only once during season.

NOTE: All treatments followed by the same letter are not significantly different at the 5% level.

Anthracnose Fungicide Study #2 - 1978

The Anthracnose (Colletotrichum graminicola) fungicide study #2 was conducted on the Burroughs Farms Golf Course, Brighton, Mi., on an irrigated annual bluegrass fairway. The plots were laid out in 3 replications of a randomized - block design in an area that was already suffering heavy damage from the disease.

The liquid fungicides were applied with a CO₂ small-plot sprayer at a volume of 40 gal/acre. The granular formulations were applied with a Scotts drop-type spreader.

Treatments were applied to the plots on August 24 and September 8. The ratings were made on September 20.

Anthracnose - Fungicide Study #2 - 1978
Burroughs Farms Golf Course, Brighton, Mi
% area diseased

Treatment	Rate/1000 ft ²	% anthracnose/plot				(DMR)
		I	II	III	AVE	
FDS Fert. + BRS Fung. 2X	5 lbs	0	2	2	1.3	A
Lesco 2887	2 oz	2	0	5	2.3	A
CGA-64251-EC	4 gm ai	0	2	5	2.3	A
Acti-dione TGF	.69 oz	2	0	5	2.3	A
FDS Fert. + BRS Fung. 1X	5.5 lbs	0	0	10	3.3	A
Lesco 2887	3 oz	5	0	5	3.3	A
FDS Fert. 20-4-12+BRS Fung.	5.5 lbs	2	5	5	4	A
Caddy	1 fl oz	10	0	5	5	AB
BFN 7789	10 fl oz.	15	2	2	6.3	ABC
BFN 8077	5 fl oz.	10	2	10	7.3	ABC
BFN 7789	5 fl oz.	20	2	2	8	ABC
Check	-	10	5	10	8.3	ABC
Cleary 3336 - FL	1 fl oz.	25	0	5	10	ABC
Acti-dione Plus	.69 oz.	5	25	2	10.7	ABC
CGA-64251 (EC)	8 gm ai	2	20	10	10.7	ABC
BFN 8090	5 oz	25	0	10	11.7	ABC
BFN 8077	10 fl oz	25	5	5	11.7	ABC
DPX 4424	1 oz ai	10	25	0	11.7	ABC
Bayleton 50 WP	1 oz ai	10	15	10	11.7	ABC
Rp 26019	1 oz	25	5	2	12.3	ABC
LLSE	1:100 dilution	2	10	25	12.3	ABC
Caddy + Bromosan FL	1 fl oz + 4 fl oz	0	40	2	14	ABC
Rp 26019	.5 oz	40	0	5	15	ABC
BFN 8090	10 oz	15	25	5	15	ABC
Fungo	1 oz	35	5	5	15	ABC
Bromosan WP	3 oz	35	5	5	15	ABC
Bromosan FL	4 fl oz	25	10	10	15	ABC
Daconil 2787-6F	6 fl oz	30	15	5	16.7	ABC
MF 598	4 oz	50	0	0	16.7	ABC
Tersan 1991	1 oz	50	2	0	17.3	ABC
Daconil 2787 WP	4 oz	40	5	10	18.3	ABC
LLSE	1:10 dilution	10	30	30	23.3	ABC
Kromad	4 oz	60	25	0	28.3	ABC
Daconil 2787-500 FL	6 fl oz	40	40	15	31.7	BC
DPX 4424	2 oz ai	25	65	5	31.7	BC
Cleary 3336	1 oz	60	10	30	33.3	C

NOTE: All treatments followed by the same letter are not significantly different at the 5% level.

Results: Anthracnose Fungicide Studies

The original anthracnose study was conducted at the Dearborn Country Club, Dearborn, Mi. When no disease developed on this site, two new studies were initiated, one at the Bay Pointe Golf Club, West Bloomfield, Mi. and one at Burrough's Farms in Brighton, Mi. Both new plot sites were already suffering severe anthracnose infections. There was initially no recovery in either treated or non-treated plots on both sites. When recovery did occur, it occurred simultaneously in both treated and non-treated plots. Hence, there was no significant difference in disease control between the treated plots and the untreated control.

Fusarium Blight Study - 1978

The 1978 Fusarium blight (Fusarium roseum) study was conducted on a commercial lawn area at the Vlastic Pickle Corporation building in Farmington, Michigan on irrigated Merion Kentucky bluegrass turf that had previously been suffering from a Fusarium infestation. The plots were 6' x 9' and were replicated four times in a randomized block design. The turf was maintained at a two-inch height of cut.

This study consisted of fungicides, wetting agents and nematicides. All treatments were applied on July 13. Application of both fungicides and wetting agents was accomplished with an Ortho hose jar applicator, while the nematicides were applied with a 3' Scotts drop-type spreader. The entire area was irrigated prior to the applications and all applications were drenched into the root zone.

The ratings were taken on July 27.

Fusarium Blight Study - 1978
Number of rings/plot

Treatment	Rate/1000 ft ²	No. Active rings/plot				AVE	(DMR)
		I	II	III	IV		
Tersan 1991	8 oz	0	0	0	1	.25	A
Tersan 1991	4 oz	0	0	2	0	.5	A
Tersan 1991 + Vydate (EC)	4 oz + 6 fl oz	0	0	2	0	.5	A
Rp 26019	8 oz (foliarly)	1	0	1	0	.5	A
BFN 8077	20 fl oz	0	0	1	1	.5	A
Vydate (EC)	12 fl oz	0	0	2	1	.75	A
DPX 4424	1 oz ai	0	0	3	0	.75	A
DPX 4424	4 oz ai	1	0	2	0	.75	A
Bayleton (50 WP) + Tersan 1991	4 oz + 4 oz	0	0	3	0	.75	A
Aqua-Gro + Tersan 1991	8 fl oz + 8 oz	1	2	1	0	1	A
Dasinat	3 lbs	0	1	3	0	1	A
Bayleton (50 WP)	4 oz	1	0	0	3	1	A
Bayleton (50 WP)	.5 oz ai-foliarly	1	1	0	2	1	A
Rp 26019	4 oz-foliarly	3	0	0	1	1	A
BFN 8006	10 lbs	0	0	3	1	1	A
BFN 8006	20 lbs	0	1	2	1	1	A
BFN 8077	10 fl oz	0	3	0	1	1	A
Bayleton (50 WP)	1 oz ai-foliarly	4	1	0	0	1.25	A
DPX 4424	2 oz ai	1	0	1	3	1.25	A
Cleary 3336	8 oz	3	0	1	1	1.25	A
BFN 7789	20 fl oz	4	0	1	1	1.5	A
CGA-64251-EC	20 gm ai	6	0	0	1	1.75	A
BFN 8090	10 fl oz	0	0	5	2	1.75	A
BFN 8090	20 fl oz	0	0	5	3	2	A
BFN 7789	10 fl oz	1	0	7	1	2.25	A
Vydate (EC)	6 fl oz	0	1	6	3	2.5	A
Fungo	8 oz	5	2	2	1	2.5	A
CGA-64251-EC	12 gm ai	7	0	1	3	2.75	A
Aqua-Gro	8 fl oz	0	4	6	1	2.75	A
Check	-	4	2	4	1	2.75	A

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

Results: Fusarium Blight Fungicide Study

A severe outbreak of Fusarium blight did not occur during 1978 and by early September the entire area had recovered from previous seasons scars. This often happens to areas that have been severely affected with Fusarium blight, due to the extra care they receive (watering + fertility) from the attention drawn to the area by the research being conducted there. It also points out the importance of good cultural practices like watering and nitrogen fertility in the control of Fusarium blight.

LLSE - Anthracnose Study - 1978

The LLSE - Anthracnose (Colletotrichum graminicola) study was applied on an annual bluegrass fairway on the Burroughs Farms Golf Course, Brighton, Mi. The fairway received normal maintenance except for fungicide and fertilizer treatments, which were applied only in conjunction with the experiment.

Treatments were applied monthly, except as noted on the data charts. The granular treatments were applied with a Scotts drop-type spreader while the LLSE and Tersan 1991 were applied with a CO₂ small-plot sprayer at a volume of 40 gal/acre. Treatments were applied to the plot on June 2, July 6, and August 8, except as noted on the data charts.

The ratings were made on September 6.

LLSE - Anthracnose Study 1 - 1978
Burroughs Farms Golf Course

Plot area received: Urea (1/2 lb. N) 6/2, 7/6, 8/8
Tersan 1991 (1 oz.) 7/6

Quality Rating Scale: 1, best -9, worst

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
LLSE (7/6 only)	1:150 dilution	2	1	1	1.3	A
LLSE (6/2 only)	1:150 dilution	2	1	1	1.3	A
LLSE (6/2 only)	1:75 dilution	2	1	1	1.3	A
LLSE (monthly)	1:150 dilution	1	1	2	1.3	A
LLSE (monthly)	1:75 dilution	1	3	1	1.7	A
Potassium (0-0-60) monthly	1 lb. K	3	1	1	1.7	A
LLSE (8/8 only)	1:150 dilution	3	1	2	2	AB
Phosphorus (0-20-0) monthly	1 lb. P	2	4	1	2.3	AB
LLSE (8/8 only)	1:75 dilution	4	2	1	2.3	AB
Check	---	5	2	1	2.7	AB
LLSE (7/6 only)	1:75 dilution	5	3	3	3.7	B

Note: Treatments followed by the same letter are not significantly different at the 5% level.

LLSE - Anthracnose Study 2 - 1978
Burroughs Farms Golf Course

Plot area received: Urea (1 lb. N) 6/2, 7/6, 8/8
Tersan 1991 (1 oz.) 7/6

Quality Rating Scale: 1, best -9, worst

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
Phosphorus (0-20-0) monthly	1 lb. P	1	3	2	2	A
LLSE (8/8 only)	1:150 dilution	1	1	5	2.3	A
LLSE (7/6 only)	1:150 dilution	1	6	1	2.7	A
LLSE (monthly)	1:75 dilution	3	3	4	3.3	A
LLSE (7/6 only)	1:75 dilution	1	4	5	3.3	A
LLSE (8/8 only)	1:75 dilution	1	4	5	3.3	A
Check	---	1	3	7	3.7	A
Potassium (0-0-60) monthly	1 lb. K	3	5	4	4	A
LLSE (monthly)	1:150 dilution	2	5	6	4.3	A
LLSE (6/2 only)	1:150 dilution	1	5	7	4.3	A
LLSE (6/2 only)	1:75 dilution	1	6	8	5	A

Note: Treatments followed by the same letter are not significantly different at the 5% level.

LLSE-Anthrachnose Study 3-1978
Burroughs Farms Golf Course

Plot area received: Urea (1/2 lb. N) 6/2, 7/6, 8/8

Quality Rating Scale: 1, best - 9, worst

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
LLSE (monthly)	1:150 dilution	3	1	2	2	A
Check	--	3	1	2	2	A
LLSE (monthly)	1:75 dilution	5	1	2	2.7	AB
Phosphorus (0-20-0) monthly	1 lb. P	5	1	2	2.7	AB
LLSE (6/2 only)	1:150 dilution	6	1	2	3	AB
LLSE (8/8 only)	1:150 dilution	6	1	2	3	AB
LLSE (7/6 only)	1:75 dilution	6	1	3	3.3	AB
Potassium (0-0-60) monthly	1 lb. K	7	1	3	3.7	AB
LLSE (6/2 only)	1:75 dilution	8	1	2	3.7	AB
LLSE (7/6 only)	1:150 dilution	7	1	3	3.7	AB
LLSE (8/8 only)	1:75 dilution	8	2	3	4.3	B

Note: Treatments followed by the same letter are not significantly different at the 5% level.

LLSE-Anthrachnose Study 4 - 1978
Burroughs Farms Golf Course

Plot area received: Urea (1 lb. N) 6/2, 7/6, 8/8

Quality Rating Scale: 1, best - 9, worst

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
Phosphorus (0-20-0) monthly	1 lb. P	1	3	2	2	A
LLSE (8/8 only)	1:150 dilution	1	1	5	2.3	A
LLSE (7/6 only)	1:150 dilution	1	6	1	2.7	A
LLSE (monthly)	1:75 dilution	3	3	4	3.3	A
LLSE (7/6 only)	1:75 dilution	1	4	5	3.3	A
LLSE (8/8 only)	1:75 dilution	1	4	5	3.3	A
Check	--	1	3	7	3.7	A
Potassium (0-0-60) monthly	1 lb. K	3	5	4	4	A
LLSE (monthly)	1:150 dilution	2	5	6	4.3	A
LLSE (6/2 only)	1:150 dilution	1	5	7	4.3	A
LLSE (6/2 only)	1:75 dilution	1	6	8	5	A

Note: Treatments followed by the same letter are not significantly different at the 5% level.

Nitrogen Fertility Timing Study - 1978

The 1978 Anthracnose (Colletotrichum graminicola) fertility study was established at Burroughs Farms Golf Course, Brighton, MI on a well-maintained annual bluegrass fairway. The fairway received normal maintenance except for fungicide and fertilizer treatments, which were applied only in conjunction with the experiment.

Fertility treatments were applied on June 2, July 6, August 8 and September 8. Tersan 1991 at 1 oz/1000 ft² was applied on July 6 to one-half the study.

Granular applications were made with a Scotts drop-type spreader while the Tersan 1991 was applied with a CO₂ small plot sprayer at a volume of 40 gal/acre.

The quality ratings were made on October 10.

Results: LLSE-Anthracnose Study, Burroughs Farms

Study # 1:

There was no significant improvement in turf quality in the LLSE-treated plots compared to the check, which received three monthly applications of 1/2 lb urea nitrogen/1000 ft² (6/2, 7/6, 8/8), a 1 oz/1000 ft² Tersan 1991 application, and no LLSE.

Study # 2:

There was no significant improvement between LLSE, applied in combination with 1 lb urea nitrogen/1000 ft² applied monthly (6/2, 7/6, 8/8) and 1 oz/1000 ft² of Tersan 1991 applied on 7/6, and the untreated checks, which received only the urea and Tersan 1991 treatments.

Study #3:

There was no significant improvement in the LLSE-treated plots compared to the check, which received 3 monthly applications of 1/2 lb urea nitrogen/1000 ft² (6/2, 7/6, 8/8) and no LLSE.

Study # 4:

There was no significant improvement in the LLSE-treated plots which received 3 monthly applications of 1 lb urea nitrogen/1000 ft² (6/2, 7/6, 8/8) when they were compared to those plots receiving only the urea.

Nitrogen Fertility Timing Study with Fungicide - 1978
Burroughs Farms Golf Course

Plot area treated with Tersan 1991 (1 oz/1000 ft²) 7/6

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
IBDU (fine)	1 lb. N	1	3	1	1.7	A
IBDU (coarse)	1 lb. N	1	2	2	1.7	A
Urea	1 lb. N	3	3	3	3	AB
IBDU (Coarse)	1/2 lb. N	3	4	4	3.7	BC
IBDU (Fine)	1/2 lb. N	2	4	5	3.7	BC
Urea	1/2 lb. N	5	6	4	5	C

Note: Treatments followed by the same letter are not significantly different at the 5% level.

Nitrogen Fertility Timing Study without Fungicide
1978
Burroughs Farms Golf Course

<u>Treatment</u>	<u>Rate/1000 ft²</u>	<u>Turf Quality</u>			AVE	(DMR)
		I	II	III		
IBDU (Fine)	1 lb. N	2	2	1	1.7	A
IBDU (Coarse)	1 lb. N	4	2	1	2.3	A
IBDU (Fine)	1/2 lb. N	5	3	3	3.7	B
Urea	1 lb. N	5	3	4	4	B
IBDU (Coarse)	1/2 lb. N	5	5	3	4.3	B
Urea	1/2 lb. N	7	5	6	6	C

Note: Treatments followed by the same letter are not significantly different at the 5% level.