TURFGRASS DISEASE MANAGEMENT REPORT 1994-95 J.M. Vargas, R. Detweiler, N. Dykema, P. Le Cureux, J. Borgman Dept. of Botany and Plant Pathology, M.S.U.

Snow Mold Fungicide Studies - 1994-95

Studies A & B

Two corporation-sponsored snow mold fungicide studies were conducted during the fall and winter of 1994-95. Study A was established at the Boyne Highlands Resort in Harbor Springs, MI and study B was established on the Tree Tops/Sylvan Resort in Gaylord, MI. Treatments were applied preventively to three replicate 6' X 9' plots on bentgrass/annual bluegrass fairways mowed at 1/2". Study A was applied between 11/3/94 and 11/7/94 (except as noted on data table) and study B was applied between 10/28/94 and 11/3/94 (except as noted on data table). Liquid treatments were applied with a CO₂ backpack sprayer at 32 PSI and 48 GPA utilizing flat fan 8002E nozzles. Granular treatments were pre-weighed and hand applied.

Study A was rated on 3/23/95, immediately after snow cover melt-off. The predominant snow mold species was *Typhula incarnata* (gray snow mold), except as indicated in Table 1. As the data indicates, disease pressure in the Boyne Highlands study was relatively light this year with the control (untreated) plots averaging only 23% disease. As frequently happens under light disease conditions, statistical separation between the treatment means is limited. This problem is exacerbated by variability in disease pressure across replicate plots within treatments. Trends in the data, however, indicate that the standard treatments for snow mold control, such as Terraclor, PCNB, Calo Clor, Scotts FF II, Daconil 2787 + Ch. 26019, etc... performed well again this year. ICIA 5504 (Heritage), in combination with numerous other products, also performed well in this test. No phytotoxicity, other than the slight yellowing noted in Table 1, was observed.

Study B was rated on 3/24/95, immediately following snow cover melt-off. The predominant snow mold species was pink snow mold (*Microdochium nivale*) with minor levels of gray snow mold (*Typhula ishikariensis*). As the data indicates, disease pressure was very heavy in this trial, with approximately 90% infection in the controls. (Table1). Under these severe disease conditions, many standard snow mold treatments gave statistically significant disease control compared to the untreated control. These include Terraclor, PCNB, Daconil 2787 + Fungo 85, Scotts FF II, and Chipco 26019 in combination with Terraclor or Dac. 2787 and the experimental ICIA 5504 (Heritage). ICIA 5504 (Heritage), in combinations with Fluazinam, Ch. 26019 + Terraclor, or Terraclor, performed very well in both studies A and B. No phytotoxicity, other than the yellowing noted in Table 1, was observed.

Applications were made at our regular application time (on a calendar-based schedule) in both studies A and B. Following application, we experienced an unusually warm, wet fall, during which the turf may have continued to grow through mid-November in northern Michigan. In retrospect, we might have observed better

disease control with traditional standards, especially the mercuries (Calo Clor and Calo Gran) if the treatments had been applied later than usual. This hypothesis is supported by comparing the Turfcide 400 treatments (12 fl oz) applied early, with the same treatment, applied late (11/12/94), as indicated in both data tables. In both studies, the later application performed better, although the difference were not statistically significant.

Table 1. Snow Mold Fungicide Study A- 1994-95 Boyne Highlands Resort, Harbor Springs, MI

Rating Scale:

Percent plot area infected by gray snow mold (Typhula incarnata)

Rating Date:

3/23/95

ing Date: 3/23/93					
Treatment	Rate/1000 ft ^{2b}	I ^c	II	III	AVE
Ch. 26019(WDG) + PCNB + Dac. Ultrex	2 oz + 4 oz + 4.8 oz	0	0	0	0
Heritage + Ch. 26019(WDG)	0.7 oz + 2 oz	0	0	0	0
Heritage + Fluazinam 500	0.7 oz + 2.5 fl oz	0	0	0	0
Heritage + Bayleton	0.7 oz + 4 oz	0	0	0	0
Heritage + Ch. 26019(WDG) + Terraclor	0.7 oz + 4 oz + 8 oz	0	0	0	0
Heritage + Ch. 26019(WDG) + Dac. 2787	0.7 oz + 4 oz + 8 fl oz	0	0	0	0
Heritage + Terraclor	0.7 oz + 8 oz	0	0	0	0
Heritage + Terraclor + Dac. 2787	0.7 oz + 8 oz + 8 fl oz	0	0	0	0
Prostar + PCNB	3 oz ai + 3 oz ai	0	0	0.5	0.2
Ch. 26019 (FLO) + Dac. 2787	8 fl oz + 8 fl oz	0.3	0	0.3	0.2
Banner(WP) + PCNB	0.94 oz + 6 oz	0	0.5	0	0.2
Banner(WP) + PCNB + Dac. 2787	0.63 oz + 4 oz + 8 fl oz	0	0.3	0.3	0.2
Heritage + Prostar	0.7 oz + 4.3 oz	0.3	0	0.3	0.2
Heritage + Terraneb	0.7 oz + 8 oz	0	0	0.5	0.2
Sentinel + PCNB	0.33 + 4 oz	0	0.3°	0.5	0.3
Banner(WP) + PCNB	1.25 oz + 6 oz	0	1	0	0.3
Scts. FF II	2X	0	0.3 ^d	0.5^{d}	0.3
Vigoro 94-298-2-GS	1 lb/100 ft ²	0	1	O^d	0.3
Heritage + Banner	0.7 oz + 4 fl oz	0	0	1	0.3
Ch. 26019(WDG) + Dac. Ultrex	4 oz + 4.8 oz	0	0.5	0.5	0.3
Calo Clor	3 oz	0.3	0	1	0.4
Heritage + Dac, 2787	0.7 oz + 8 fl oz	0.3	0	1	0.4
Vigoro 94-292-6-GS	10 lbs	0.3	O_q	1^d	0.4
Ch. 26019(FLO) + Dac. 2787	4 fl oz + 8 fl oz	1	0	0.5	0.5
EXP 10452A + Dac. Ultrex	4 oz + 4.8 oz	0	0	2	0.7
Heritage + Ch 26019(WDG)	0.7 oz + 4 oz	1	0	1	0.7
Turfcide 400 (applied 11/12/94)	12 fl oz	0.3°	0	2°	0.8

AMV-6 (applied 11/12/94) 8 fl oz 0.3 0 Vigoro 94-292-2-GS 10 lbs 24 0 ANDFG 190 4 lbs 0 0.3 Thalonil (DF) + Ch. 26019(FLO) 4.75 cx + 4 fl oz 0.5 0.3 Heritage 0.7 ox 1 2 Vigoro 94-298-LGS 1 lb/100 ft² 0.3 0 Vigoro 94-292-LGS 10 lbs 14 0.3 Sentinel + Ch. 26019(FLO) 0.33 ox + 2 fl ox 1 2 Defend + Spotrete 16 fl ox + 4 ox 1' 2 Banner(WP) + Duc. 2787 1.25 ox + 8 fl ox 5 0 UB1 9250 107 ox 0 0.5 Sentinel 0.33 ox 1 0 ANDFG 182 6 lbs 3¹ 1² Curalan + Dac. 2787 4 ox + 8 fl ox 2 1 Scis. FF II 1X 3 2 Thalonil(F) + Ch. 26019(FLO) 8 fl ox + 4 fl ox 0.3 0.5 Sheritage + Fungo 85 0.7 ox + 2.2 ox 5' 0.5 Heritage + Fungo 85 0.7 ox + 2.2 ox 5'						
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Revere 8 oz 3 0 Defend 24 fl oz 3 1 Banner(WP) + Dac. 2787 0.94 oz + 8 fl oz 5 7 Turfcide 400(applied 11/3/94) 12 fl oz 0.3 0 Calo Gran 6 lbs 2 5 Lesco R100002 5 lbs 10 7 Vigoro 94-297-4C-GS 302 gm/100 ft² 12 7 Vigoro 94-292-3-GS 10 lbs 0.3d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	a commo a m			10		6.2
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Banner(WP) + Dac. 2787 0.94 oz + 8 fl oz 5 7 Turfcide 400(applied 11/3/94) 12 fl oz 0.3 0 Calo Gran 6 lbs 2 5 Lesco R100002 5 lbs 10 7 Vigoro 94-297-4C-GS 302 gm/100 ft² 12 7 Vigoro 94-292-3-GS 10 lbs 0.3d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2					15	6
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Calo Gran 6 lbs 2 5 Lesco R100002 5 lbs 10 7 Vigoro 94-297-4C-GS 302 gm/100 ft² 12 7 Vigoro 94-292-3-GS 10 lbs 0.3d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	BROWNED SHOULD BE SHOWN THE SECURITY SHOULD				5(2)	6.3
Lesco R100002 5 lbs 10 7 Vigoro 94-297-4C-GS 302 gm/100 ft² 12 7 Vigoro 94-292-3-GS 10 lbs 0.3d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	Turfeide 400(applied 11/3/94)	12 fl oz	0.3	0	20	6.8
Vigoro 94-297-4C-GS 302 gm/100 ft² 12 7 Vigoro 94-292-3-GS 10 lbs 0.3d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	Calo Gran	6 lbs	2	5	2(13)	7.3
Vigoro 94-292-3-GS 10 lbs 0.3 ^d 2 ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	Lesco R100002	5 lbs	10	7	5	7.3
ANDFG 176 2 lbs 5 7 UBI 9249 160 oz 0 2	Vigoro 94-297-4C-GS	302 gm/100 ft ²	12	7	3	7.3
UBI 9249	Vigoro 94-292-3-GS	10 lbs	0.3 ^d	2	2(18) ^d	7.4
	ANDFG 176	2 lbs	5	7	7(8)	9
	UDI 0240	160	0	2	25	0
ANDEG 179 4 lbs 12 5					25	9
	ANDEG 179	4 IDS	12	5	7(3)	9

EXP 10452A	4 oz	1	1	25	9
Heritage + Curalan	0.7 oz + 2 oz	7	0	20	9
Heritage + Dithane M-45	0.7 oz + 6 oz	5	10	10(2)	9
Vigoro 94-297-4A-GS	151 gm/100 ft ²	7	7 ^d	15	9.7
Banner (WP) + CGA 173506	1.25 oz + 0.5 oz	1	0.5	30	10.5
ANDFG 187	4 lbs	10	10	12	10.7
Vigoro 94-292-1-GS	10 lbs	2^d	12(3)	5(15)	12.3
ANDFG 180	2 lbs	12	7(3)	5(15)	14
Prostar	3 oz ai	3	10	30	14.3
ANDFG 178	4 lbs	7	3	15(20)	15
ANDFG 186	4 lbs	20	7	10(10)	15.7
Banner(WP)	0.94 oz	2	10	25(10)	15.7
Vigoro 94-298-4-GS	324 gm/100 ft ²	40	10	1	17
Vigoro 94-297-4B-GS	227 gm/100 ft ²	12	7	35	18
Lesco R100012	1.67 lbs	30(5)	12	7(5)	19.7
ANDFG 189	4 lbs	2	0	60	20.7
ANDFG 185	3.33 lbs	10	7 ^d	22(3)	20.7
Banner(WP) + CGA 173506	0.94 oz + 0.5 oz	0	2	55(5)	20.7
Turfcide 10G	160 oz	25	20(5)	15(5)	23.3
ANDFG 188	4 lbs	15	5	40(10)	23.3
Consyst	9 oz	50	10	2(10)	24
Dac. 2787 + Fungo 85	8 fl oz + 1.2 oz	2	20	50	24
Lesco R100009	5 lbs	35(5)	10	25(5)	26.7
					0.1001078.0074
Control		20	7(5)	40(10)	27.3
ANDFG 184	3.33 lbs	15	1	60(15)	30.3
Lesco R100011	2.5 lbs	30	20	45	31.7
Vigoro 94-298-3-GS	1 lb/100 ft ²	35	0.5	60(5)	33.5
ANDFG 177	2 lbs	7	25(5)	45(20)	34
Consyst	6 oz	65	5	35	35
	Cleary 3336 + Spotrete	2 oz + 8 oz	20	60	25
A-E	ANDFG 183	3.33 lbs	35	30	85
A-D	AMV-30 (applied 11/12/94)	20 oz	15	70(5)	55(10)
ABC	Lesco R100010	5 lbs	35	35	85
AB					
Vigoro 94-292-7-GS	10 lbs	40	55(10)	60(10)	58.3

^bRates are formulation/1000 ft², unless indicated as active ingredient (ai), or otherwise.

Table 2. Snow Mold Fungicide Study B - 1994-95 Tree Tops/Sylvan Resort, Gaylord, MI

Rating Scale: Percent plot area infected by pink snow mold (*Microdochium nivale*) primarily, and gray snow mold (*Typhula ishikariensis*) secondarily.

Rating Date:

3/24/95

Treatment	Rate/1000 ft ^{2b}	I	II	Ш	AVG
Turfcide 400 (applied 11/12/94)	12 fl oz	0.3°	0°	0.5	0.3
Heritage + Ch. 26019(WDG) + Terraclor	0.7 oz + 4 oz + 8 oz	1	0	0	0.3
AMV-6 (applied 11/12/94)	8 fl oz	1	0°	0.3€	0.4
Heritage + Dac. 2787 + Terraclor	0.7 oz + 8 fl oz + 8 oz	2	0	0	0.7
Heritage + Terraclor	0.7 oz + 8 oz	1	0.5	1	0.8
S	0	3 ^f	0	0	1
Consyst	9 oz		0	0	
Heritage + Fluazinam 500	0.7 oz + 2.5 fl oz	7	1	2	3.3
Heritage + Fungo 85	0.7 oz + 2.2 oz	12	2	0.5°	4.8
Heritage + Rubigan AS	07 oz + 8 fl oz	10	7	0.5	5.8
Revere	8 oz	20	1	0.5°	7.2
Ch. 26019(WDG) + PCNB + Dac. Ultrex	2 oz + 4 oz + 4.8 oz	20	0.3	3	7.8
Banner(WP) + PCNB + Dac. 2787	0.63 oz + 4 oz + 8 fl oz	20	2	5	9.0
Sets. FF II	2X	10	12	5	9.0
Dac. 2787 + Fungo 85	8 fl oz + 1.2 oz	7 ^f	20 ^f	0.5	9.2
Lesco R100002	5 lbs	25	3	3°	10.3
Consyst	6 oz	30 ^r	If	3°	11.3
Turfcide 400(applied 10/30/94)	12 fl oz	20	5	10	11.7
Scts. FF II	1X	30°	1°	5°	12.0
Heritage + Banner	0.7 oz + 4 fl oz	25	10	2	12.3
Cleary 3336 + Spotrete(WDG)	2 oz + 8 oz	35 ^f	1 ^r	10°	15.3
Heritage + Ch. 26019(WDG) + Dac. 2787	0.7 oz + 4 oz + 8 fl oz	12	35	3	16.7
Banner(WP) + PCNB	1.25 oz + 6 oz	12	20	20	17.3
Curalan + Dac. 2787	4 oz + 8 fl oz	25	10	20	18.3
Heritage + Dac. 2787	0.7 oz + 8 fl oz	25	20	15	20
ANDFG 190	4 lbs	35	10	40	28.3
Ch. 26019(FLO) + Dac. 2787	8 fl oz + 8 fl oz	20	75	2	32.3
ANDFG 184	3.33 lbs	50	40	12	34

^{*}Treatments followed by the same letter are not significantly different from each other at 5% level (Tukeys's Honestly Significant Differences test).

Numbers inside parentheses represent percent of plot area infected by pink snow mold (*Microdochium nivale*). Total percent plot area infected is sum of both numbers. ^dSlight greening effect noted.

[&]quot;Turf slightly yellowed.

^fTyphula ishikariensis.

Heritage + Vorlan	0.7 oz + 4 oz	40	5	60	35
Vigoro 94-297-4C-GS	302 gm/100 ft ²	35	50	20	35
Vigoro 94-298-1-GS	1 lb/100 ft ²	35	7	65	35.7
Banner(WP) + PCNB	0.94 oz + 6 oz	25	20	65	36.7
ANDFG 183	3.33 lbs	60	10	40	36.7
ANDFG 186	4 lbs	40	45	25	36.7
ANDFG 185	3.33 lbs	35	65	15	38.3
Ch. 26019(WDG) + Dac. Ultrex	2 oz + 4.8 oz	95	20	5	40
Heritage + Ch. 26019(WDG)	0.7 oz + 2 oz	35	40	50	41.7
Prostar + PCNB	3 oz ai + 3 oz ai	50	40	40°	43.3
Calo Clor	3 oz	75°	45°	10 ^d	43.3
Thalonil(F) + Ch. 26019(FLO)	8 fl oz + 4 fl oz	70	50	12	44
Heritage	0.7 oz	45	30°	60	45
Heritage + Terraneb	0.7 oz + 8 oz	30	85	20	45
UBI 9249	160 oz	85	10	40 ^c	45
Banner(WP) + CGA 173506	0.94 oz + 0.5 oz	45	70	30	48.3
Vigoro 94-297-46-GS	227 gm/100 ft ²	35	80	30	48.3
Heritage + Bayleton	0.7 oz + 4 oz	80	3	65	49.3
Heritage + Dithane (M-45)	0.7 + 6 oz	35	40	75	50
Heritage + Ch. 26019(WDG)	0.7 oz + 4 oz	40	75	35	50
Heritage + Curalan	0.7 oz + 2 oz	50 ^f	35	70	51.7
Vigoro 94-297-4A-GS	151 gm/100 ft ²	85	20	50	51.7
Defend + Spotrete (WDG)	16 fl oz + 4 oz	55	65	35	51.7
Defend	24 fl oz	50	50	60	53.3
ANDFG 187	4 lbs	65	35	60	53.3
Heritage + Prostar	0.7 oz + 4.3 oz	35	40	85	53.3
Vigoro 94-298-3-GS	1 lb/100 ft ²	75	60	30	55
Thalonil (DF) + Ch. 26019(FLO)	4.75 oz + 4 fl oz	65	80	20	55
Vigoro 94-298-4-GS	324 gm/100 ft ²	65	40	60	55
Ch. 26019(FLO) + Dac. 2787	4 fl oz + 8 fl oz	60	85	25	56.7
Banner(WP) + CGA 173506	1.25 oz + 0.5 oz	45	70 ^r	60	58.3
Vigoro 94-292-5-GS	10 lbs	40	75	65	60
Vigoro 94-298-2-GS	1 lb	45	70	70	61.7
Vigoro 94-292-6-GS	10 lbs	60	95	35	63.3
Vigoro 94-292-3-GS	10 lbs	90	100	10	66.7

					100 ST 000	
A	NDFG 182	6 lbs	70	45	95	70
Е	XP 10452A + Dac. Ultrex	4 oz + 4.8 oz	50	70	95	71.7
В	anner(WP) + Dac. 2787	0.94 oz + 8 fl oz	85	95	35	71.7
C	h. 26019(WDG) + Dac. Ultrex	4 oz + 4.8 oz	50	75	95	73.3
L	esco R100010	5 lbs	85	75	60	73.3
U	BI 9250	107 oz	80	65°	75€	73.3
В	anner(WP) + Dac. 2787	1.25 oz + 8 fl oz	95	75	50	73.3
A	NDFG 181	6 lbs	75	80	70	75
			(4.47)			
	esco R100011	2.5 lbs	80	65	85	76.7
	esco R100009	5 lbs	95	45	90	76.7
	igoro 94-292-2-GS	10 lbs	60	80	90	76.7
Е	XP 10452A	4 oz	95	45	95	78.3
V	igoro 94-292-1-GS	10 lbs	70	98	70	79.3
Α	NDFG 188	4 lbs	95	50	95	80
C	uralan	4 oz	60	90	95	81.7
C	alo Gran	6 lbs	80°	85c	85	83.3
S	entinel + Ch. 26019(FLO)	0.33 oz + 2 fl oz	98	98	60	85.3
S	entinel + PCNB	0.33 oz + 4 oz	80	95	85	86.7
					0246	72-12-11
	igoro 94-292-7-GS	10 lbs	95	100	75	90
	urfcide 10 G	160 oz	95	95	80	90
	NDFG 180	2 lbs	80	95	95	90
	anner(WP)	0.94 oz	95	90	85	90
Α	NDFG 189	4 lbs	85	90	98	91
C	ontrol		90	98	85	91
Α	NDFG 176	2 lbs	100	85	90	91.7
Α	NDFG 178	4 lbs	98	98	85	93.7
٧	igoro 94-292-4-GS	10 lbs	85	98	100	94.3
Α	NDFG 177	2 lbs	100	98	85	94.3
	D 200	2	0.5	0.5	0.5	05
	rostar + Dac. 2787	3 oz ai + 3.2 oz ai	95	95	95	95
	esco R100012	1.67 lbs	98	95	95	96
	entinel	0.33 oz	100	95	95	96.7
	NDFG 179	4 lbs	95	98	100	97.7
Α	MV-30 (applied 11/12/94)	20 oz	98	100	100	99.3
P	rostar	3 oz ai	98	100	100	99.3
*Tr	eatments followed by same letter are not significantly different from	n each other at 5% level (Tukeys Honesth	Significant Diffe	rence Test)		

^{*}Treatments followed by same letter are not significantly different from each other at 5% level (Tukeys Honestly Significant Difference Test).

^bRates are formulations per 1000 ft², unless indicated as active ingredient (ai), or otherwise. ^cTurf mildly yellowed. ^dTurf moderately yellowed. ^cTyphula incarnata. ^tTyphula ishikariensis.