

TURFGRASS DISEASE MANAGEMENT REPORT 1992-93
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SNOW MOLD FUNGICIDE STUDIES - 1992-93

Two snow mold fungicide studies were conducted during the fall and winter of 1992-93. One study was established at the Boyne Highlands Resort Golf Course in Harbor Springs, Michigan and a second study was established at Birchwood Farms Golf Course, also in Harbor Springs, Michigan. The treatments were applied preventively to three replicate 6' x 9' plots on bentgrass/annual bluegrass fairways mowed at ½". The Boyne Highlands study was applied on 10/27/92, and the Birchwood Farms study was applied on 10/26/92.

Boyne Highlands Resort, Harbor, Springs, MI

This study was rated on 3/31/93, immediately following snow cover melt-off. The snow molds observed this year were primarily pink snow mold (*Microdochium nivale*) and, secondarily, *Typhula ishikariensis*, gray snow mold. The unusual predominance of pink snow mold over gray snow mold may be explained by an unusually wet and cool 1992 fall which may have allowed an undetected, pre-treatment pink snow mold inoculum build-up on the golf course where this study was located. Also, the fairway on which this study was located was unusually lush at the time of treatment, due to the late season release of fertilizer applied earlier in the season. This may have allowed the turf to somewhat "outgrow" the snow mold protection. For whatever reasons, disease pressure was extremely severe in the study this year, with disease levels of 98% in the untreated controls. Unfortunately, some of the standard snow mold controls failed to control the disease in this study this year (Table 1). Examples include Calo-Gran and the Daconil 2787 + Chipco 26019 combination treatments. Conversely, PCNB fungicide formulated as Terraclor (WP) (8 oz/1000 ft² rate) and as Scotts F+FII (2 x rate) performed relatively well again this year.

No phytotoxicity, other than slight discoloration in Calo Clor plots, was noted.

Birchwood Farms Resort, Harbor Springs, MI

This study was rated on 4/14/93. Unlike the Boyne Highlands study, this study had an approximate 50:50 mix of pink snow mold (*Microdochium nivale*) and gray snow mold (*Typhula ishikariensis*) throughout the plot area. Disease pressure was also very severe in this study this year, with 98% disease incidence in the controls. In this study, however, we achieved higher levels of disease control with many treatments, especially the GS/SM experimentals, then in the

Boyne Highlands study. Unfortunately, we again experienced the failure of disease control by standards such as the Daconil 2787 + Chipco 26019 combination, Calo-Gran, and Calo-Clor (Table 2).

No phytotoxicity, other than slight discoloration in Calo-Clor plots, was noted.

Table 1. Snow Mold Fungicide Study #1 - 1993

Boyne Highlands Resort
Harbor Springs, MI

Rating Scale: Percent plot area infected by pink snow mold (*Microdochium nivale*) and gray snow mold (*Typhula ishikariensis*).^b
Rating Date: 3/31/93

Treatment	Rate/1000 ft ^{2c}	I	II	III	Avg	DMR (.05) ^a
GS/SM 92-06	----	10	5	5	6.7	W
Terraclor	8 oz	10	15	3	9.3	UW
GS/SM 92-05	----	10	15	7	10.7	UVW
Scotts F + F II	2x	3	15	15	11.0	UVW
UBI 1876	12 fl oz	7	20	10	12.3	T-W
GS/SM 92-16	----	5	5	30	13.3	S-W
Cleary PCNB + Spotrete + Greenzit	6 oz + 6 fl oz + 6 fl oz	3	10	35	16.0	R-W
Calo-Clor	3 oz	5	40	5	16.7	Q-W
GS/SM 92-03	----	10	15	25	16.7	Q-W
GS/SM 92-04	----	5	2	45	17.3	Q-W
GS/SM 92-15	----	10	3	40	17.7	Q-W
GS/SM 92-02	----	25	20	15	20.0	P-W
CGA 173506 + Banner	7 gm ai + 8 gm ai	25	35	25	28.3	O-W
GS/SM 92-13	----	2	50	35	29.0	O-W
Ch.26019 (WDG) + Terraclor + D.2787	2 oz + 4 oz + 4 fl oz	45	25	25	31.7	N-W
Scotts F + FII	1x	10	40	50	33.3	M-W
CGA 173506 + Banner	3.5 gm ai + 8 gm ai	45	40	30	37.3	L-W
GS/SM 92-12	----	45	60	25	43.3	K-U
ICIA 5504 (JFR 795)	10 gm ai	15	50	65	43.3	K-U
D.2787 + Fluazinam	8 fl oz + 3 fl oz	5	65	65	45.0	K-U
ICIA 5504 (WF 1594)	10 gm ai	50	20	70	46.7	J-T
Banner + D.2787	2 fl oz + 8 fl oz	65	30	50	48.3	I-S
GS/SM 92-14	----	40	30	75	48.3	J-S
GS/SM 92-01	----	30	75	45	50.0	H-R
D.2787 + Fluazinam	8 fl oz + 2 fl oz	40	50	30	50.0	H-R
Calo-Gran	6 lbs	35	75	45	51.7	F-Q
ICIA 5504 (WF 1594)	5 gm ai	50	35	70	51.7	G-Q
LAD + X-77	100 ppm + 0.1% v/v	40	35	85	53.3	F-P
GS/SM 92-08	----	50	40	75	55.0	E-P
GS/SM 92-11	----	75	65	25	55.0	E-P
ICIA 5504 (JF 12795)	5 gm ai	70	65	35	56.7	D-O
D.2787 + ASC 67103	8 fl oz + 1.25 fl oz	45	45	85	58.3	C-O
D.2787	8 fl oz	75	80	30	61.7	B-O
ICIA 5504 (WF 1594)	2.5 gm ai	60	40	98	66.0	A-N
D.2787 + ASC 67106	8 fl oz + 0.33 oz	35	75	90	66.7	A-N
Prostar (NA 313/01)	2.5 oz ai	85	65	55	68.3	A-M
Ch.26019(WDG) + Terraclor	2 oz + 4 oz	65	75	65	68.3	A-M
GS/SM 92-09	----	60	50	98	69.3	A-L
GS/SM 92-18 + Fertilizer (18-4-10)	---- + 1 lb N (nitrogen)	85	40	85	70.0	A-L
EXP 10364A	4 fl oz	95	85	35	71.7	A-L

Treatment	Rate/1000 ft ^{2c}	I	II	III	Avg	DMR (.05) ^a
GS/SM 92-10	----	80	40	95	71.7	A-L
CGA-173506	7 gm ai	75	80	65	73.3	A-K
GS/SM 92-18	----	90	35	98	74.3	A-K
Banner	2 fl oz	80	75	70	75.0	A-K
Rubigan + D.2787	2 fl oz + 8 fl oz	85	60	98	81.0	A-J
Bayleton	2 oz	80	65	100	81.7	A-J
RH-7592	0.5 fl oz	95	85	65	81.7	A-J
Curalan + D.2787	1 oz ai + 3 oz ai	75	75	95	81.7	A-J
EXP 10364A	3 fl oz	75	80	98	84.3	A-I
UBI 4040	5 lbs	98	80	75	84.3	A-I
Ch.26019 (WDG) + D.2787	4 oz + 8 fl oz	70	95	90	85.0	A-H
Bayleton + D.2787	2 oz + 8 fl oz	70	90	95	85.0	A-H
ICIA 5504 (JF 12795)	2.5 gm ai	90	75	95	86.7	A-G
Prostar (NA 248/04)	3 oz ai	95	70	98	87.7	A-F
Prostar (NA 248/04) + X-77	3 oz ai + 0.1% v/v	80	90	98	89.3	A-E
Curalan	1 oz ai	85	95	95	91.7	A-D
Ch.26019 (WDG) + D.2787	2 oz + 8 fl oz	85	95	95	91.7	A-D
Eagle	0.63 oz	95	85	95	91.7	A-D
Terraclor (G)	7.5 lbs	90	90	98	92.7	A-D
GS/SM 92-17	----	95	90	95	93.3	A-C
GS/SM 92-17 + Fertilizer (18-4-10)	---- + 1 lb N	98	98	90	95.3	A-C
Fertilizer (18-4-10)	1 lb N	98	98	90	95.3	AB
Rubigan	2 fl oz	95	98	95	96.0	AB
Control	----	100	95	100	98.3	A
Phyton 27	2.5 fl oz/5 gal	98	100	98	98.7	A

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

^bDue to intermingled infection, separate disease ratings were not feasible.

^cRates listed are formulation unless listed as active ingredient (ai).

Table 2. Snow Mold Fungicide Study #2 - 1993

Birchwood Farms Resort
Harbor Springs, MI

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

Rating Date: 4/14/93

Treatment	Rate/1000 ft ^{2c}	I	II	III	Avg	DMR (.05) ^a
GS/SM 92-16	----	1	0	1	0.7	U
GS/SM 92-14	----	1	1	1	1.0	U
GS/SM 92-15	----	0	1	2	1.0	TU
GS/SM 92-04	----	0	1	3	1.3	TU
GS/SM 92-06	----	1	0	3	1.3	TU
CGA 173506 + Banner	7 gm ai + 8 gm ai	2	0	3	1.7	TU
Cleary PCNB + Spotrete + Greenzit	6 oz + 6 fl oz + 6 fl oz	0	2	3	1.7	TU
GS/SM 92-01	----	5	2	0	2.3	STU
Scotts F+FII	2x	1	7	3	3.7	STU
GS/SM 92-02	----	0	7	5	4.0	STU
GS/SM 92-05	----	0	3	10	4.3	STU
GS/SM 92-13	----	1	5	20	8.7	R-U
CGA 173506 + Banner	3.5 gm ai + 8 gm ai	3	3	20	8.7	R-U
Terraclor	8 oz	5	20	5	10.0	R-U
GS/SM 92-03	----	0	5	30	11.7	Q-U
Ch.26019 + Terraclor + D.2787	2 oz + 2 oz + 4 fl oz	1	5	35	13.7	P-U
Ch.26019 + Terraclor	2 oz + 4 oz	1	35	10	15.3	P-U
UBI 1876	12 fl oz	25	1	20	15.3	P-U
Calo-Clor	3 oz	15	30	25	23.3	O-T
Scotts F + FII	1x	2	20	50	24.0	N-S
CGA 173506	7 gm ai	30	30	25	28.3	N-R
D.2787 + Fluazinam	8 fl oz + 3 fl oz	15	35	40	30.0	M-R
D.2787 + Fluazinam	8 fl oz + 2 fl oz	40	40	15	31.7	M-Q
ICIA 5504 (JF12795)	10 gm ai	30	35	35	33.3	M-P
ICIA 5504 (WF1594)	10 gm ai	40	50	25	38.3	L-O
Banner + D.2787	2 fl oz + 8 fl oz	40	40	40	40.0	L-O
EXP 10364A	4 fl oz	60	35	35	43.3	K-O
GS/SM 92-18	----	40	35	60	45.0	J-N
GS/SM 92-12	----	30	35	85	50.0	I-M
ICIA 5504 (WF 1594)	2.5 gm ai	70	35	65	56.7	H-L
ICIA 5504 (JF12795)	5 gm ai	40	75	70	61.7	G-K
Bayleton + D.2787	2 oz + 8 fl oz	60	70	55	61.7	G-K
GS/SM 92-08	----	30	85	80	65.0	F-J
GS/SM 92-09	----	55	60	85	66.7	E-I
D.2787 + ASC 67103	8 fl oz + 1.25 oz	60	65	75	66.7	E-I
Banner	2 fl oz	60	70	75	68.3	D-I
GS/SM 92-18 + 18-4-10	1 lb N (nitrogen)	65	70	70	68.3	D-I
GS/SM 92-10	----	40	80	90	70.0	C-I
ICIA 5504 (WF1594)	5 gm ai	65	55	95	71.7	C-I
Calo-Gran	6 lbs	70	80	65	71.7	C-I
GS/SM 92-11	----	45	90	80	71.7	C-I
Ch.26019 (WDG) + D.2787	4 oz + 8 oz	80	65	75	73.3	B-H

Treatment	Rate/1000 ft ^{2c}	I	II	III	Avg	DMR (.05) ^a
GS/SM 92-17	----	65	80	75	73.3	B-H
GS/SM 92-17 + 18-4-10	---- + 1 lb N	75	70	85	76.7	A-H
ICIA 5504 (JF12795)	2.5 gm ai	75	65	90	76.7	A-H
Curalan + D.2787	1 oz ai + 3 oz ai	90	60	85	78.3	A-H
EXP 10364A	3 fl oz	75	85	80	80.0	A-G
Rubigan + D.2787	2 fl oz + 8 fl oz	85	90	80	85.0	A-F
Prostar (NA 313/01)	2.5 oz ai	85	90	80	85.0	A-F
Ch.26019 + D.2787	2 fl oz + 8 fl oz	85	80	90	85.0	A-F
RH 7592	0.5 fl oz	95	95	65	85.0	A-F
UBI 4040	5 lbs	95	80	85	86.7	A-F
D.2787	8 fl oz	75	90	95	86.7	A-F
Bayleton	2 oz	75	95	95	88.3	A-E
Curalan	1 oz ai	98	95	75	89.3	A-D
D.2787 + ASC 67106	8 fl oz + 0.33 oz	90	95	90	91.7	ABC
KLM liquid	2x	90	100	95	95.0	AB
KLM compost	2x	98	98	90	95.3	AB
Rubigan	2 fl oz	95	95	98	96.0	A
Terraclor (G)	7.5 lbs	95	95	98	96.0	A
Phyton 27	2.5 fl oz/5 gal	90	98	100	96.0	A
KLM liquid	1x	98	99	98	98.3	A
Eagle	0.63 oz	98	99	98	98.3	A
Prostar (NA 248/04) + X-77	3 oz ai + 0.1% v/v	100	95	100	98.3	A
Control	----	98	98	100	98.7	A
Fertilizer (18-4-10)	1 lb N	98	98	100	98.7	A
KLM compost	1x	98	100	100	99.3	A
Prostar (NA 248/04)	3 oz ai	98	100	100	99.3	A

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

^bDue to intermingled infection, separate disease ratings were not feasible.

^cRates listed are formulation, unless listed as active ingredient (ai).

SUMMER PATCH FUNGICIDE STUDIES - 1993

Fungicide studies for the preventive control of summer patch (*Magnaporthe poae*) on annual bluegrass were initiated when soil temperatures reached 65°F at a 2" depth at the Hancock Turfgrass Research Center in East Lansing, Michigan. Studies were established on irrigated, annual bluegrass (*Poa annua*) fairways on three golf courses in Michigan where disease was present in previous years. All treatments were applied prior to disease occurrence with reapplication taking place at the intervals listed in the data tables (Tables 4 and 5). Liquid treatments were applied foliarly (unirrigated) while granular treatments were pre-weighed and hand applied. The fairways were maintained at ½" height of cut and were fertilized at ¼-½ lb. N/mo. (except treatments which included fertilizer). These areas were treated for insects, however, no general maintenance fungicides were applied to the study areas. Application equipment and procedures were as previously described. Application intervals and frequencies were occasionally altered from contract protocols in order to conform to our standard recommendations for preventive control of summer patch.

No objectional phytotoxicity was observed in the summer patch studies this year, although a number of treatments did produce a greening effect in the turf, as noted in the data tables. These effects were subtle and had largely abated by the September ratings.

48 GENERAL SESSION - HIGHLIGHTS AND UPDATES

Treatment	Rate/1000 ft ²	I	II	III	IV	Avg	DMR (I) ^a
RH 7592 + Latron B 1956	0.5 fl oz + 0.06% v/v	100	66.7	75	50	72.9	A-H
RH 0611	6 oz	80	100	60	50	72.5	A-H
E.I. DS (Strain #16)	3 lbs/mo	87.5	66.7	37.5	83.3	68.8	A-I
EXP 10307A	4 fl oz	50	50	66.7	100	66.7	B-I
EXP 10307A + EXP 02164B	4 fl oz + 3.2 fl oz	33.3	37.5	90	100	65.2	C-I
Fluazinam	2 fl oz	20	75	65	100	65.0	C-I
Banner	4 fl oz	40	100	75	40	63.8	D-I
EXP 10064C	2 fl oz	100	75	20	50	61.3	E-I
Banner	2 fl oz	28.6	37.5	100	60	56.5	F-I
Rubigan	4 fl oz	14.3	66.7	86.7	50	54.4	F-J
EXP 10307A	3 fl oz	25	46.7	60	85	54.2	F-J
Control (fertilized)	--	57.1	33.3	25	53.3	42.2	H-J
Fluazinam	1 fl oz	42.9	60	20	42.9	41.5	H-J
Herbruck Fertilizer	1 lb N/mo	41.7	6.7	50	60	39.6	IJ
Ch.26019 (WDG)	4 oz	16.7	50	33.3	0	25.0	J
Control (unfertilized)	--	0	0	-20	0	-5.0	K

^aTreatments followed by the same letter are not significantly different from each other at the 10% level.

COMPOUNDS TESTED IN 1992-93 SEASON

<u>Product</u>	<u>Formulation</u>	<u>Manufacturer</u>
AND. 373 - AND. 376	N/A	The Andersons
ASC 67098-X	N/A	ISK Biotech
ASC 67098-Z	N/A	ISK Biotech
ASC 67103	N/A	ISK Biotech
ASC 67106	N/A	ISK Biotech
ASC 67135	N/A	ISK Biotech
Astron Plus	N/A	Floratine Products
Banner	1.1 EC	Ciba Geigy Corp
Bayleton	25 DF	Miles Corp
Calo Clor	90 W	Grace Sierra
Calo Gran	2.7 G	Grace Sierra
CGA 173506	75 WG	Ciba Geigy Corp
Chipco 26019	25 F	Rhone Poulenc
Chipco 26019 (WDG)	50 WDG	Rhone Poulenc
Cleary PCNB	75 WP	W.A. Cleary Chemical Corp
Curalan (DF)	50 DF	BASF Corp
Curalan	4.17 F	BASF Corp
Daconil 2787	40.4 F	ISK Biotech
Daconil SDG	N/A	ISK Biotech
Eagle	40 W	Rohm & Haas
E.I. DS (Strain #5)	N/A	Emerald Isle/Ocean Organics
E.I. DS (Strain #16)	N/A	Emerald Isle/Ocean Organics
EXP 02164B	45 C	Rhone Poulenc
EXP 10064C	1.67 SC	Rhone Poulenc
EXP 10307A	0.84 SC	Rhone Poulenc

<u>Product</u>	<u>Formulation</u>	<u>Manufacturer</u>
EXP 10364A	3.3 F	Rhone Poulenc
FCI-6444	N/A	Fermone Corp
Fertilizer (18-4-10)	G	Lebanon (Country Club)
Fluazinam	500 F	ISK Biotech
FP 0492	N/A	Floratine Products
Greenzit	N/A	W.A. Cleary Chemical Corp
GS-SM-01-GS-SM-18	N/A	Grace Sierra
Herbruck Fertilizer	10-2-10	Herbruck's
IBDU Fertilizer	31-0-0	Vigoro
ICIA 5504	50 WG	Zeneca Ag Products
ICIA 5504 (JFR 795)	N/A	Zeneca Ag Prods
ICIA 5504 (WF 1594)	N/A	Zeneca Ag Prods
ICIA 5504 (JF 12795)	N/A	Zeneca Ag Prods
KLM Liquid	N/A	Bio Grounds Keeper, Inc
KLM Compost	N/A	Bio Grounds Keeper, Inc
LAD	N/A	Vigoro, Inc
Latron B-1956	N/A	Rohm & Haas
Panasea Plus	N/A	Emerald Isle
Panasea Plus + Tryptophan	N/A	Emerald Isle
Phyton 27	N/A	Source Technology Biologicals, Inc
Prostar (NA 248/04)	70 WP	Nor-Am Chemical Corp
Prostar (NA 313/01)	70 WP	Nor-Am Chemical Corp
RH 0611	62.3 WP	Rohm & Haas
RH 7592	2 F	Rohm & Haas
Rubigan	1.1 F	Dow Elanco
S-4404	N/A	O.M. Scotts & Sons
Scotts FF II	14-3-3 fertilizer, 15.4% PCNB	O.M. Scotts & Sons
Sentinel	40 WG	Sandoz Agro, Inc
Spotrete	75 WDG	W.A. Cleary Chemical Corp
Terraclor	75 WP	Uniroyal Chemical Co
Terraclor (G)	10 G	Uniroyal Chemical Co
Thalonil	N/A	Terra International
Thatch X	N/A	Emerald Isle/Ocean Organics
Thatch X Blank	N/A	Emerald Isle/Ocean Organics
TRA 0028	N/A	Terra International
Turf Restore	10-2-6 fertilizer	Ringer Corp
UBI 1876	N/A	Uniroyal Chemical Co
UBI 4040	N/A	Uniroyal Chemical Co
Urea	46-0-0 fertilizer	The Andersons
X-77	surfactant	Nor-Am Chemical Corp