



2023-2024 Snow Mold Control Evaluation: Marquette Golf Club – Marquette, MI

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OBJECTIVE

To evaluate fungicides for the control of gray snow mold (caused by *Typhula incarnata*), speckled snow mold (*T. ishikariensis*), and Microdochium patch (*Microdochium nivale*) on golf course turfgrass.

MATERIALS AND METHODS

This evaluation was conducted at Marquette Golf Club in Marquette, MI on a creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) golf course fairway maintained at a height of 0.5 inches. Individual plots measured 3 ft x 10 ft and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 psi using a CO₂-pressurized boom sprayer equipped with one Teejet AI9508EVS nozzle. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft², except for Protone SG (trt 24) which was applied in 2.0 gallons of water per 1000 ft². Early applications were made on 4 Oct 2023, and late applications were made on 2 Nov 2023. The experimental plot area was not inoculated. Snow cover was present from early-January through mid-March, a total of approximately 75 days. Disease severity, turf quality, and turf color were measured on 18 Mar 2024. Disease severity was visually rated as percent area affected, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, and chlorophyll content (turfgrass color) was rated using a FieldScout CM 1000 Chlorophyll Meter from Spectrum Technologies, Inc. (Aurora, IL). Treatment means were analyzed using Fisher's LSD method and are presented in Table 1.

RESULTS AND DISCUSSION

Disease pressure in Marquette was high, with nontreated controls averaging nearly 72% disease. All the disease was caused by *Microdochium nivale*. Despite this heavy pressure, 61 of the 66 public treatments reduced disease relative to the non-treated control. In addition, 40 of the 66 treatments provided excellent disease control in the lowest statistical category (typically less than 10% disease). Turf quality closely mirrored disease severity and phytotoxicity was not observed with any treatment.

Table 1: Mean snow mold severity, turf quality, and turf color were assessed on 18 Mar 2024 at Marquette Golf Club in Marquette, MI.

	Treatment	Rate	Application Timing ^a	Disease Severity ^b	Turf Quality ^c	Turf Color ^d
1	Non-treated control			71.3abc	2.3tu	112.8D
2	Aramax	1.0 fl oz/1000 ft2	Late	10.0r-y	5.8f-j	179.3e-t
3	Aramax	1.0 fl oz/1000 ft2	Late	0.0y	7.0a-e	192.0a-m
	26GT Turfcide	4.0 fl oz/1000 ft2 8.0 fl oz/1000 ft2				
4	Aramax	1.0 fl oz/1000 ft2	Late	3.0wxy	6.5c-g	184.8d-q
	Medallion	1.0 fl oz/1000 ft2				
5	Insignia Pro	0.8 fl oz/1000 ft2	Late	4.3v-y	6.3d-h	186.0c-p
6	Insignia Pro	0.8 fl oz/1000 ft2	Late	2.5wxy	6.5c-g	188.0b-o
	Medallion	1.0 fl oz/1000 ft2				
7	Posterity XT	3.0 fl oz/1000 ft2	Late	1.3xy	7.5abc	187.5b-o
	Ascernity	1.0 fl oz/1000 ft2				
	Par	0.37 fl oz/1000 ft2				
8	Posterity XT	1.5 fl oz/1000 ft2	Late	2.5wxy	7.0a-e	193.0a-l
	Tuque exoGEM	2.87 fl oz/1000 ft2				
9	Par	0.37 fl oz/1000 ft2	Late	6.3t-y	6.3d-h	175.5g-v
	Tuque exoGEM	2.87 fl oz/1000 ft2				
10	Tebuconazole	1.1 fl oz/1000 ft2	Late	1.3xy	7.5abc	209.0a-f
	Par	0.37 fl oz/1000 ft2				
11	Tuque exoGEM	2.87 fl oz/1000 ft2	Early Late	0.5y	7.8ab	195.0a-k
	Instrata	7.0 fl oz/1000 ft2				
12	Par	0.37 fl oz/1000 ft2	Late	7.5t-y	5.8f-j	200.8a-i
	Tuque exoGEM	2.87 fl oz/1000 ft2				
13	Concert II	5.5 fl oz/1000 ft2	Late	7.5t-y	6.5c-g	185.0d-q
	Par	0.37 fl oz/1000 ft2				
14	Tuque exoGEM	2.87 fl oz/1000 ft2	Late	7.5t-y	6.8b-f	195.5a-k
	Banner Max	2.0 fl oz/1000 ft2				
15	Par	0.37 fl oz/1000 ft2	Late	0.0y	8.0a	186.8c-p
	PM Tebuconazole	1.0 fl oz/1000 ft2				
	PM Propiconazole	2.0 fl oz/1000 ft2				
	PM Chlorothalonil	3.0 fl oz/1000 ft2				
	PM Fluoxastrobin	0.4 fl oz/1000 ft2				
	Activator+SA	0.2 fl oz/1000 ft2				
Par	0.37 fl oz/1000 ft2					
LSD P=.05				17.87	1.24	32.36

^aEarly treatments were applied on 4 Oct 2023. Late treatments were applied on 2 Nov 2023.

^bMean percent diseased area assessed on 18 Mar 2024

^cQuality was visually assessed where 1 = dead, 6 = acceptable, 9 = dark green.

^dColor was assessed using a FieldScout CM1000 Chlorophyll Meter from Spectrum Technologies, Inc.

Table 1(cont): Mean snow mold severity, turf quality, and turf color were assessed on 18 Mar 2024 at Marquette Golf Club in Marquette, MI.

	Treatment	Rate	Application Timing ^a	Disease Severity ^b	Turf Quality ^c	Turf Color ^d
16	PM Propiconazole	1.0 fl oz/1000 ft2	Early	0.0y	8.0a	194.8a-k
	Turfcide	3.0 fl oz/1000 ft2	Early			
	Activator+SA	0.2 fl oz/1000 ft2	Early/Late			
	Par	0.37 fl oz/1000 ft2	Early/Late			
	PM Tebuconazole	1.0 fl oz/1000 ft2	Late			
	PM Propiconazole	2.0 fl oz/1000 ft2	Late			
	PM Fluoxastrobin	0.3 fl oz/1000 ft2	Late			
17	Turfcide	4.0 fl oz/1000 ft2	Late	6.3t-y	6.5c-g	188.3b-o
	PM Tebuconazole	1.0 fl oz/1000 ft2	Late			
	PM Propiconazole	2.0 fl oz/1000 ft2				
	PM Chlorothalonil	3.0 fl oz/1000 ft2				
	Activator+SA	0.2 fl oz/1000 ft2				
Par	0.37 fl oz/1000 ft2					
18	PM Propiconazole	2.0 fl oz/1000 ft2	Early	0.0y	8.0a	202.8a-i
	Par	0.37 fl oz/1000 ft2	Early			
	PM Tebuconazole	1.0 fl oz/1000 ft2	Late			
	PM Fluoxastrobin	0.2 fl oz/1000 ft2	Late			
	Turfcide	3.0 fl oz/1000 ft2	Late			
	Activator+SA	0.2 fl oz/1000 ft2	Late			
19	Extra Green 20	6.0 oz/1000 ft2	Early/Late	50.0d-i	3.5o-s	146.0u-B
20	Sulfur DF	5.0 oz/1000 ft2	Early/Late	55.0c-g	3.3p-t	135.3x-D
21	Duraphite 12	6.0 oz/1000 ft2	Early/Late	67.5a-d	2.5stu	113.0CD
22	Sulfur DF	5.0 oz/1000 ft2	Early/Late	66.3bcd	2.5stu	129.0y-D
	Duraphite 12	6.0 oz/1000 ft2				
23	Potassium bicarbonate	1.7 lb/1000 ft2	Early/Late	63.8b-e	3.0q-t	123.0A-D
24	Protone SG	1.35 oz/1000 ft2	Early/Late	61.3b-f	3.0q-t	149.8r-B
25	ReTain	0.27 oz/1000 ft2	Early/Late	67.5a-d	2.8rst	123.0A-D
26	Zio	6.0 oz/1000 ft2	Early/Late	56.3c-g	3.0q-t	138.3w-D
27	Rhapsody	10 fl oz/1000 ft2	Early/Late	47.5e-j	3.5o-s	147.0t-B
28	Civitas Pre-Mixed	8.5 fl oz/1000 ft2	Early	10.0r-y	6.0e-i	170.5i-w
		34.0 fl oz/1000 ft2	Late			
29	Primo Maxx	1.0 fl oz/1000 ft2	Early/Late	85.0a	1.5u	112.3D
30	Anuew	0.735 fl oz/1000 ft2	Early/Late	76.3ab	2.3tu	126.8z-D
31	Instrata	11.0 fl oz/1000 ft2	Late	1.8xy	6.8b-f	178.3e-u
32	Instrata	5.5 fl oz/1000 ft2	Late	15.0o-y	5.3h-l	171.3i-v
33	Instrata Activo	5.5 fl oz/1000 ft2	Late	20.0n-w	5.0i-m	160.5m-y
		1.5 fl oz/1000 ft2	Late			
34	Medallion	1.0 fl oz/1000 ft2	Late	13.0p-y	5.5g-k	180.0e-s
	Torque	1.1 fl oz/1000 ft2	Late			
LSD P=.05				17.87	1.24	32.36

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	Treatment	Rate	Application Timing ^a	Disease Severity ^b	Turf Quality ^c	Turf Color ^d
35	Traction	1.3 fl oz/1000 ft ²	Late	8.8s-y	5.8f-j	209.8a-f
	26/36	6.0 fl oz/1000 ft ²				
	Par	0.28 fl oz/1000 ft ²				
36	NFA0800009	0.196 fl oz/1000 ft ²	Late	5.0u-y	6.8b-f	209.5a-f
	NUP19026	0.5 fl oz/1000 ft ²				
	26/36	6.0 fl oz/1000 ft ²				
	Par	0.28 fl oz/1000 ft ²				
37	NFA0630301	1.1 fl oz/1000 ft ²	Late	0.5y	7.5abc	201.5a-i
	26/36	6.0 fl oz/1000 ft ²				
	Par	0.28 fl oz/1000 ft ²				
38	NUP19022	0.213 fl oz/1000 ft ²	Late	4.3v-y	6.8b-f	204.5a-h
	NFA0800009	0.196 fl oz/1000 ft ²				
	NUP19026	0.5 fl oz/1000 ft ²				
	26/36	6.0 fl oz/1000 ft ²				
Par	0.28 fl oz/1000 ft ²					
39	3-Way Fungicide	6.5 lb/1000 ft ²	Late	22.5m-u	5.0i-m	164.5k-x
40	Exp 0614	6.5 lb/1000 ft ²	Late	40.0g-m	4.0m-q	155.0p-A
41	Exp 0810	6.5 lb/1000 ft ²	Late	23.8m-t	4.8j-n	167.3j-x
42	Exp 0814	6.5 lb/1000 ft ²	Late	18.8n-x	5.0i-m	152.8q-A
43	Exp 1011	6.5 lb/1000 ft ²	Late	21.3n-v	4.8j-n	158.5n-z
44	EXP 20	0.942 fl oz/1000 ft ²	Late	71.3abc	2.3tu	147.0t-B
	CA6242A	0.371 fl oz/1000 ft ²				
45	A22011B	0.175 fl oz/1000 ft ²	Late	45.0f-l	3.8n-r	147.8s-B
	CA6242A	0.371 fl oz/1000 ft ²				
46	A23543A	2.25 fl oz/1000 ft ²	Late	23.8m-t	4.8j-n	167.3j-x
	CA6242A	0.371 fl oz/1000 ft ²				
47	A23543A	2.25 fl oz/1000 ft ²	Late	11.3q-y	5.5g-k	197.0a-j
	A6780L	2.0 fl oz/1000 ft ²				
	CA6242A	0.371 fl oz/1000 ft ²				
48	A23543A	2.25 fl oz/1000 ft ²	Late	13.8p-y	5.5g-k	190.8a-n
	A9898A	1.3 fl oz/1000 ft ²				
	CA6242A	0.371 fl oz/1000 ft ²				
49	A23543A	2.25 fl oz/1000 ft ²	Late	11.3q-y	5.5g-k	205.0a-h
	A19858D	1.1 fl oz/1000 ft ²				
	CA6242A	0.371 fl oz/1000 ft ²				
50	A23543A	2.25 fl oz/1000 ft ²	Late	0.0y	8.0a	193.5a-k
	A14212C	3.0 fl oz/1000 ft ²				
	CA6242A	0.371 fl oz/1000 ft ²				
51	A23419A	4.0 lb/1000 ft ²	Late	30.0j-p	4.5k-o	157.3o-z
52	A12704A	0.385 oz/1000 ft ²	Late	27.5l-r	4.8j-n	161.0l-y
	A15457R	0.233 fl oz/1000 ft ²				
53	A21790A	6.0 fl oz/1000 ft ²	Late	0.0y	8.0a	202.5a-i
	A21791A	2.0 fl oz/1000 ft ²				
	A12531B	5.5 fl oz/1000 ft ²				
LSD P=.05				17.87	1.24	32.36

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54	Interface	6.0 fl oz/1000 ft ²	Late	6.3t-y	6.3d-h	196.0a-k
	Mirage	2.0 fl oz/1000 ft ²				
55	Interface	6.0 fl oz/1000 ft ²	Late	1.8xy	7.3a-d	205.0a-h
	Mirage	2.0 fl oz/1000 ft ²				
	Daconil Weatherstik	5.0 fl oz/1000 ft ²				
56	Interface	6.0 fl oz/1000 ft ²	Late	0.0y	8.0a	214.0a-d
	Mirage	2.0 fl oz/1000 ft ²				
	Turfcide	5.0 fl oz/1000 ft ²				
57	Interface	4.0 fl oz/1000 ft ²	Late	5.5u-y	6.3d-h	205.8a-h
	Mirage	2.0 fl oz/1000 ft ²				
58	Interface	4.0 fl oz/1000 ft ²	Late	5.0u-y	6.5c-g	194.8a-k
	Mirage	2.0 fl oz/1000 ft ²				
	Densicor	0.196 fl oz/1000 ft ²				
59	Interface	4.0 fl oz/1000 ft ²	Late	0.0y	8.0a	209.5a-f
	Mirage	2.0 fl oz/1000 ft ²				
	Turfcide	5.0 fl oz/1000 ft ²				
60	Interface	4.0 fl oz/1000 ft ²	Late	3.0wxy	6.5c-g	184.8d-q
	Mirage	2.0 fl oz/1000 ft ²				
	Secure Action	0.5 fl oz/1000 ft ²				
61	ESTC184	4.0 fl oz/1000 ft ²	Late	6.3t-y	6.0e-i	184.5d-q
	ESTC120	2.0 fl oz/1000 ft ²				
	ESTC280	0.2 fl oz/1000 ft ²				
62	ESTC184	4.0 fl oz/1000 ft ²	Late	0.0y	8.0a	186.5c-p
	ESTC120	2.0 fl oz/1000 ft ²				
	ESTC499	3.0 fl oz/1000 ft ²				
63	ESTC120	2.0 fl oz/1000 ft ²	Late	26.3m-s	4.8j-n	178.5e-t
	ESTC280	0.4 fl oz/1000 ft ²				
64	ESTC120	2.0 fl oz/1000 ft ²	Late	0.0y	7.8ab	218.3abc
	ESTC499	5.9 fl oz/1000 ft ²				
65	ESTC183	2.0 fl oz/1000 ft ²	Late	8.0t-y	6.0e-i	177.8f-u
66	ESTC183	2.0 fl oz/1000 ft ²	Late	1.3xy	6.8b-f	197.0a-j
	ESTC192	1.0 fl oz/1000 ft ²				
LSD P=.05				17.87	1.24	32.36

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