



**2023-2024 Snow Mold Timing Model:
OJ Noer Research Facility – Madison, WI
Wausau Country Club – Wausau, WI
Timber Ridge Golf Club – Minocqua, WI**

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OBJECTIVE

To evaluate efficacy of a new predictive model for optimal timing of fungicide applications to control gray snow mold (*Typhula incarnata*), speckled snow mold (*T. ishkariensis*), and Microdochium patch (*Microdochium nivale*) on fairway height turfgrass.

MATERIALS AND METHODS

This evaluation was conducted at three locations: the OJ Noer Turfgrass Research and Education Facility in Madison, WI on a ‘Penncross’ creeping bentgrass (*Agrostis stolonifera*) fairway maintained at a height of 0.5 inches, and at Wausau Country Club in Wausau, WI and Timber Ridge Golf Club in Minocqua, WI on a creeping bentgrass 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 AI9508EVS Teejet air induction nozzle. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft². Disease severity, turf quality, and turf color were evaluated on 5 Mar 2024 in Madison and in Wausau, and on 6 Mar 2024 in Minocqua. 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 the following tables.

RESULTS AND DISCUSSION

Both Minocqua and Wausau had minimal snow mold due to very little snowfall and no usable data was collected from these sites. Snow mold pressure was highest in Madison and Instrata was less effective during early application timings compared to Interface + Mirage. However, snow mold suppression with both treatments was very effective beginning at the 42% threshold. The snow mold timing model will continue to be evaluated and fine-tuned in future years.

Table 1. Mean snow mold severity and turf quality were assessed on 5 Mar 2024 at the OJ Noer Turfgrass Research and Education Facility in Madison, WI.

Treatment	Rate	Model Threshold (%)	Application Timing	Disease Severity ^a	Turf Quality ^b	Turf Color ^c	
1	Non-treated control			40.0ab	4.0bc	142.5bcd	
2	Instrata	9.3 fl oz/1000 ft ²	82	9/20/23	35.0b	4.3b	141.5bcd
3	Interface	4.0 fl oz/1000 ft ²	82	9/20/23	2.5c	6.5a	134.8d
	Mirage	2.0 fl oz/1000 ft ²					
4	Instrata	9.3 fl oz/1000 ft ²	62	9/28/23	53.8a	3.3c	141.5bcd
5	Interface	4.0 fl oz/1000 ft ²	62	9/28/23	0.0c	7.0a	146.3bcd
	Mirage	2.0 fl oz/1000 ft ²					
6	Instrata	9.3 fl oz/1000 ft ²	42	10/31/23	0.0c	7.0a	137.3cd
7	Interface	4.0 fl oz/1000 ft ²	42	10/31/23	0.0c	7.0a	154.5ab
	Mirage	2.0 fl oz/1000 ft ²					
8	Instrata	9.3 fl oz/1000 ft ²	22	11/3/23	0.0c	7.0a	151.5bc
9	Interface	4.0 fl oz/1000 ft ²	22	11/3/23	0.0c	7.0a	170.5a
	Mirage	2.0 fl oz/1000 ft ²					
10	Instrata	9.3 fl oz/1000 ft ²	Calendar	11/30/23	0.0c	7.0a	144.3bcd
11	Interface	4.0 fl oz/1000 ft ²	Calendar	11/30/23	0.0c	7.0a	144.8bcd
	Mirage	2.0 fl oz/1000 ft ²					
				LSD P=.05	18.09	0.9	16.69

^a Mean percent diseased area assessed on 5 Mar 2024. Means followed by the same letter are not statistically different.

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

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

Table 2: Heating Degree Days and 2-inch soil temperature at the OJ Noer Turfgrass Research Facility in Madison, WI in 2023.

Trt #	Application Date(s)	HDD ^z	2" Soil Temp (F)
2 & 3	Sep 20	0	64.0
4 & 5	Sep 28	0	63.2
6 & 7	Oct 31	102	35.0
8 & 9	Nov 3	138	42.5
10 & 11	Nov 30	474	31.6

^zHeating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie mean temperatures above 50°F) were removed and the summation is presented here.

Table 3. Mean snow mold severity and turf quality were assessed on 5 Mar 2024 at Wausau Country Club in Wausau, WI.

Treatment	Rate	Model Threshold (%)	Application Timing	Disease Severity ^a	Turf Quality ^b	Turf Color ^c	
1	Non-treated control			6.3a	6.5d	195.3a	
2	Instrata	9.3 fl oz/1000 ft ²	82	10/5/23	1.3b	6.8cd	204.0a
3	Interface	4.0 fl oz/1000 ft ²	82	10/5/23	0.0b	8.0a	215.3a
	Mirage	2.0 fl oz/1000 ft ²					
4	Instrata	9.3 fl oz/1000 ft ²	62	10/17/23	0.0b	7.0cd	149.8a
5	Interface	4.0 fl oz/1000 ft ²	62	10/17/23	0.0b	7.8ab	189.5a
	Mirage	2.0 fl oz/1000 ft ²					
6	Instrata	9.3 fl oz/1000 ft ²	42	10/25/23	0.0b	7.0cd	161.3a
7	Interface	4.0 fl oz/1000 ft ²	42	10/25/23	0.0b	7.8ab	166.3a
	Mirage	2.0 fl oz/1000 ft ²					
8	Instrata	9.3 fl oz/1000 ft ²	22	10/31/23	0.0b	7.0cd	146.0a
9	Interface	4.0 fl oz/1000 ft ²	22	10/31/23	0.0b	8.0a	173.3a
	Mirage	2.0 fl oz/1000 ft ²					
10	Instrata	9.3 fl oz/1000 ft ²	Calendar	11/17/23	0.0b	7.3bc	151.3a
11	Interface	4.0 fl oz/1000 ft ²	Calendar	11/17/23	0.0b	8.0a	186.0a
	Mirage	2.0 fl oz/1000 ft ²					
				LSD P=.05	3.5	0.72	47.86

^a Mean percent diseased area assessed on 5 Mar 2024. Means followed by the same letter are not statistically different.

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

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

Table 4: Heating Degree Days and 2-inch soil temperature at Wausau Country Club in Wausau, WI in 2023.

Trt #	Application Date(s)	HDD ^z	2" Soil Temp (°F)
2 & 3	Oct 5	0	58.3
4 & 5	Oct 17	41.5	45.4
6 & 7	Oct 25	69.5	52.2
8 & 9	Oct 31	146	36.0
10 & 11	Nov 17	312.5	37.6

^zHeating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie mean temperatures above 50°F) were removed and the summation is presented here.

Table 5. Mean snow mold severity and turf quality were assessed on 6 Mar 2024 at Timber Ridge Golf Club in Minocqua, WI.

Treatment	Rate	Model Threshold (%)	Application Timing	Disease Severity ^a	Turf Quality ^b	Turf Color ^c	
1	Non-treated control			20.0a	5.5c	126.5a	
2	Instrata	9.3 fl oz/1000 ft ²	82	10/5/23	2.5a	6.8b	177.5a
3	Interface	4.0 fl oz/1000 ft ²	82	10/5/23	0.0a	7.3ab	170.5a
	Mirage	2.0 fl oz/1000 ft ²					
4	Instrata	9.3 fl oz/1000 ft ²	62	10/11/23	0.0a	7.0ab	152.8a
5	Interface	4.0 fl oz/1000 ft ²	62	10/11/23	0.0a	7.0ab	155.8a
	Mirage	2.0 fl oz/1000 ft ²					
6	Instrata	9.3 fl oz/1000 ft ²	42	10/20/23	6.3a	6.5bc	165.3a
7	Interface	4.0 fl oz/1000 ft ²	42	10/20/23	1.3a	7.3ab	186.3a
	Mirage	2.0 fl oz/1000 ft ²					
8	Instrata	9.3 fl oz/1000 ft ²	22	10/31/23	0.0a	7.0ab	155.0a
9	Interface	4.0 fl oz/1000 ft ²	22	10/31/23	0.0a	8.0a	170.0a
	Mirage	2.0 fl oz/1000 ft ²					
10	Instrata	9.3 fl oz/1000 ft ²	Calendar	11/3/23	0.0a	7.0ab	138.3a
11	Interface	4.0 fl oz/1000 ft ²	Calendar	11/3/23	1.3a	7.5ab	173.0a
	Mirage	2.0 fl oz/1000 ft ²					
				LSD P=.05	14.62	1.12	46.52

^a Mean percent diseased area assessed on 6 Mar 2024. Means followed by the same letter are not statistically different.

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

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

Table 6: Heating Degree Days and 2-inch soil temperature at Timber Ridge GC in Minocqua, WI in 2023.

Trt #	Application Date(s)	HDD ^z	2" Soil Temp (°F)
2 & 3	Oct 5	11.5	56.5
4 & 5	Oct 11	65.5	47.0
6 & 7	Oct 20	125.5	46.8
8 & 9	Oct 31	248.5	36.0
10 & 11	Nov 3	328	32.0

^zHeating Degree Days was calculated by taking the mean temperature for each day beginning on July 1st and subtracting that number from 50°F. Negative numbers (ie mean temperatures above 50°F) were removed and the summation is presented here.