



Worried About Controlling Snow Mold?

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One of the most common questions I get as manager of the Turfgrass Diagnostic Lab is what I would suggest applying to control snow mold. While I know every person who asks the question would like a one to three word response, depending on how many fungicides I would suggest tank mixing, the truth is there are a host of combinations that work effectively to control snow mold. Each golf course is unique, and several factors need to be considered when selecting what is likely the single most expensive fungicide application a course will make in a year. Factors to consider include climate, history of snow mold, course expectations, and foremost in many peoples minds the cost of the fungicide.

Course climate can vary greatly just within the state of Wisconsin. Average seasonal snowfall totals range from around 40 inches of snow in the south to approximately 200 inches in the northern snow belt. Many courses in the southern portion of the state might not put a great deal of effort into their snow mold control program, while snow mold control for the upcoming winter might be thought about on July 4th for many in the northern portion of the state. Putting aside average seasonal snowfall totals, some golf courses or portions of golf courses in the south seem to defy logic and experience significant snow mold damage every year. Knowing this is key for developing your program. The expectations for course conditioning also play a large role in developing your snow mold program. Ten percent snow mold can be manageable on one course and unacceptable on the next. Taking into consideration a major event held in the spring is also important, as cold springs will hamper recovery.

Considering the current economic climate in both the national economy as well as golf in general, it is understandable that many superintendents need to spend less on snow mold fungicides this season. We tested 64 standard and experimental fungicide treatments in our 2008-2009 snow mold fungicide trials, and many of them provide excellent control under most conditions at affordable prices. But cutting snow mold control expenses to the degree that will lead to increased recovery costs in the spring will negate those savings and might lead to revenue losses as golfers choose to play elsewhere.

The snow mold fungicide trials we conduct every year are meant to give superintendents in Wisconsin and beyond unbiased scientific data regarding the most effective treatments for controlling snow mold under varying disease pressure. The 2008-2009 snow mold trials was held at five sites across Wisconsin, Michigan, and



Figure 1: Snow mold severity at Wawonowin CC was very high in 2008-2009, though a few treatments did provide excellent control



Figure 2: Snow mold severity at Sentryworld GC was also high, though many treatments provided excellent protection.

Minnesota to provide a wide array of snow mold pressures. Sites at Edina CC in Edina, MN; Bent Creek CC in Eden Prairie, MN; and Timberstone GC in Iron Mountain, MI did not experience significant snow mold pressure and did not yield significant results. The remaining two sites at Sentryworld GC in Stevens Point, WI and Wawonowin CC in Champion, MI did provide an excellent test of different treatments and will be featured here.

Wawonowin CC is 20 minutes west of Marquette in Michigan's upper peninsula. They receive on average over 200 inches of snow annually and experience continuous snow cover for nearly half the year. One would expect extreme snow mold pressures at this site, and they would be absolutely correct (Figure 1). One or two applications of each treatment was made according to

the cooperator's instructions, with the early application made on October 2nd, 2008 and the late treatment made on October 28th, 2008. Over 220 inches of snow fell on the area in the winter of 2008-2009, and continuous snow cover was 170 days. Non-treated controls had 96.3% disease, an astronomically high number that shows just how severe snow mold can be (Table 1). Most of the 64 treatments we tested did not provide acceptable control of snow mold, which we defined as less than 5% disease.

Despite the high disease pressure treatments 29, 61, and 63 provided complete control of snow mold at Wawonowin CC. Treatment 29 contained the experimental USF26019T, which has since been named Interface by Bayer Crop Science, along with Triton Flo. Treatment 61 contained 26/36 along with a Cleary Chemical experimental, and treatment 63 contained 26/36 tank-mixed with Endorse and another Cleary Chemical experimental fungicide. In addition to these, many other treatments provided acceptable control. The fact that several different treatments provided acceptable control at this site is significant because if it works at Wawonowin, it will likely work anywhere.

Sentryworld GC is in central Wisconsin and has been host to our snow mold fungicide trials for a number of years. While snow mold severity was high at this site, it was lower than at Wawonowin CC and more representative of what many superintendents in the state face at their courses. Fungicide applications were made on October 21st, 2008 and November 25th, 2008 for the early and late applications, respectively. Consecutive days of snow cover reached approximately 100 days at Sentryworld GC. Non-treated controls averaged 76.3% disease, still high enough to provide breakthrough on weaker treatments but not so high that nearly all of the treatments broke down.

The table displaying the results and statistical analysis of the Sentryworld trial has not been included with this article, but can be accessed on the Turfgrass Diagnostic Lab's website (www.plantpath.wisc.edu/tld/pdf/uwsnowmoldreports2009.pdf). Many treatments provided complete or excellent snow mold control in this trial, including several that exhibited significant breakthrough in Wawonowin. Treatments that included Trinity, Interface, 26/36, Instrata, and Insignia in the tank-mix provided the most consistent control, though several other fungicides provided excellent control as well.

Hopefully it is clear from these results that there are more than just one or two fungicides that will provide excellent snow mold control. I urge you to look over the results provided here and on the website, take into account the factors discussed earlier in the article, and make the best decision based on your facility's needs and expectations. There is one question that arises that I do feel comfortable answering in one word. When a superintendent asks if any of these treatments will provide help with ice damage, the answer is no. 🌱

Table 1: Snow Mold and Color Ratings Recorded on April 16th, 2009 at Wawonowin CC

Treatment	Rate	Timing ^a	Disease severity ^b	Color ^c
1 Untreated Control			96.3 a	3.3 f
10 Emerald	0.13 OZ/M	Late	58.8 a-j	5.8 a-e
T-Methyl 4.5L	3 FL OZ/M	Late		
11 Emerald	0.13 OZ/M	Late	75 a-f	5.8 a-e
T-Methyl 4.5L	4 FL OZ/M	Late		
12 Emerald	0.13 OZ/M	Late	83.8 a-d	6 a-e
T-Methyl 4.5L	0.75 FL OZ/M	Late		
13 Emerald	0.13 OZ/M	Late	61.3 a-i	6.3 a-e
Trinity	1 FL OZ/M	Late		
14 Emerald	0.13 OZ/M	Late	92.5 abc	5.5 b-e
Iprodione Pro	3 FL OZ/M	Late		
15 Emerald	0.13 OZ/M	Late	73.8 a-g	5.8 a-e
Iprodione Pro	4 FL OZ/M	Late		
16 Trinity	1 FL OZ/M	Late	87.5 a-d	6 a-e
Iprodione Pro	2 FL OZ/M	Late		
17 Trinity	1 FL OZ/M	Late	67.5 a-h	6 a-e
Iprodione Pro	3 FL OZ/M	Late	85 a-d	5.8 a-e
18 Iprodione Pro	3 FL OZ/M	Late	53.8 c-i	6 a-e
19 Trinity	1 FL OZ/M	Late		
Iprodione Pro	4 FL OZ/M	Late		
20 Curalan EG	1 OZ/M	Late	86.3 a-d	6 a-e
21 Curalan EG	1 OZ/M	Early	42.5 f-n	6 a-e
Daconil Ultrex	3.2 OZ/M	Early		
Insignia	0.5 OZ/M	Late		
Trinity	1 FL OZ/M	Late		
22 Curalan EG	1 OZ/M	Early	57.5 a-j	5.8 a-e
Daconil Ultrex	3.2 OZ/M	Early		
Trinity	1.5 FL OZ/M	Late		
Daconil Ultrex	5 OZ/M	Late		
23 Trinity	1.5 FL OZ/M	Late	61.3 a-i	6 a-e
Insignia	0.5 OZ/M	Late		
Daconil Ultrex	5 OZ/M	Late		
24 Trinity	1 FL OZ/M	Late	26.3 i-o	6.3 a-e
Insignia	0.5 OZ/M	Late		
Iprodione	4 FL OZ/M	Late		
25 Tourney	0.37 OZ/M	Early/Late	35 g-o	5.8 a-e
Daconil Ultrex	3.2 OZ/M	Early/Late		
26 Tourney	0.37 OZ/M	Early/Late	1.3 o	5.3 cde
3336 Plus	4 FL OZ/M	Early/Late		
27 USF26019T	4 FL OZ/M	Late	3 o	7.8 a
Triton Flo	0.85 FL OZ/M	Late		
28 USF26019T	5 FL OZ/M	Late	1.3 o	7.8 a
Triton Flo	0.85 FL OZ/M	Late		
29 USF26019T	6 FL OZ/M	Late	0 o	7.8 a
Triton Flo	0.85 FL OZ/M	Late		
30 Triton Flo	0.85 FL OZ/M	Late	3 o	7.3 abc
Compass	0.25 OZ/M	Late		
Daconil Ultrex	5 OZ/M	Late		
31 Reserve	5.4 FL OZ/M	Late	3.8 o	7.5 ab
Compass	0.25 OZ/M	Late		
32 Tartan	2 FL OZ/M	Late	25 i-o	5.5 b-e
Daconil Ultrex	5 OZ/M	Late		
33 Instrata	9.3 FL OZ/M	Late	13.8 no	6.3 a-e
34 Instrata	7 FL OZ/M	Late	5.5 no	6.5 a-e
Renown	2.5 FL OZ/M	Late		
35 Headway	1.5 FL OZ/M	Late	6.3 no	6.5 a-e
Concert	8.25 FL OZ/M	Late		
36 NB36275	0.37 OZ/M	Early/Late	85 a-d	6 a-e
37 NB36275	0.73 OZ/M	Early/Late	85 a-d	6 a-e
38 NB36277	7.28 FL OZ/M	Early/Late	52.5 d-l	5.8 a-e
39 NB36277	14.6 FL OZ/M	Early/Late	32.5 h-o	5.8 a-e
40 NB36278	3.27 OZ/M	Early/Late	83.8 a-d	5.5 b-e
41 NB36278	6.5 OZ/M	Early/Late	88.8 a-d	5.8 a-e
42 NB36691	9.4 FL OZ/M	Early/Late	82.5 a-e	5.8 a-e
43 NB36691	18.8 FL OZ/M	Early/Late	56.3 b-k	5.5 b-e
44 Revere 4000	14 FL OZ/M	Early/Late	2.5 o	5.8 a-e
45 Heritage	0.7 OZ/M	Early/Late	51.3 d-m	5.5 b-e
46 Daconil Ultrex	5 OZ/M	Early/Late	90 a-d	5 de
47 QP T/MC	6 OZ/M	Early	2.5 o	6.3 a-e
QP Ipro	4 FL OZ/M	Late		
QP Propiconazole	2 FL OZ/M	Late		
48 QP T/MC	6 OZ/M	Late	1.8 o	6.3 a-e
QP Ipro	4 FL OZ/M	Late		
QP Propiconazole	2 FL OZ/M	Late		
49 QP Ipro	4 FL OZ/M	Late	15 mno	6 a-e
QP Propiconazole	2 FL OZ/M	Late		
50 QP Ipro	4 FL OZ/M	Late	17.5 i-o	6 a-e
QP Chlorothalonil	5.5 FL OZ/M	Late		
51 Disarm	0.36 FL OZ/M	Late	51.3 d-m	6 a-e
52 Disarm G	4.5 LB/M	Late	93.8 ab	5.3 cde
53 Disarm C	3 FL OZ/M	Late	43.8 e-n	6 a-e
Chipco 26GT	4 FL OZ/M	Late		
54 26/36	4 FL OZ/M	Late	18.6 k-o	6 a-e
Endorse	4 OZ/M	Late		
55 26/36	4 FL OZ/M	Late	20.5 j-o	5.8 a-e
Endorse	4 OZ/M	Late		
Spotrete	6 OZ/M	Late		
56 Spectro	5.75 OZ/M	Late	43.8 e-n	6 a-e
CX-30	2 FL OZ/M	Late		
57 26/36	4 FL OZ/M	Late	8.8 no	6.3 a-e
CX-30	2 FL OZ/M	Late		
58 Endorse	4 OZ/M	Late	8 no	6.8 a-d
CX-30	2 FL OZ/M	Late		
59 26/36	4 FL OZ/M	Late	7.5 no	6.5 a-e
Endorse	4 OZ/M	Late		
CX-30	1 FL OZ/M	Late		
60 26/36	4 FL OZ/M	Late	12.5 no	6.3 a-e
Endorse	4 OZ/M	Late		
Spectro	5.75 OZ/M	Late		
61 26/36	4 FL OZ/M	Late	0 o	6.5 a-e
CX-28	1.2 FL OZ/M	Late		
62 Endorse	4 OZ/M	Late	7.3 no	6.8 a-d
CX-28	1.2 FL OZ/M	Late		
63 26/36	4 FL OZ/M	Late	0 o	6.3 a-e
Endorse	4 OZ/M	Late		
CX-28	1.2 FL OZ/M	Late		
64 Chipco 26GT	4 FL OZ/M	Late	35 g-o	6 a-e
Daconil WeatherStik	5 FL OZ/M	Late		

Means followed by same letter do not significantly differ (P=0.05, Student-Newman-Keuls)

^a Early and late fungicide treatments were applied on Oct. 2nd, 2008 and Oct. 28th, 2008, respectively

^b Mean percent diseased area

^c Color was rated on a scale of 1-9 where 1 = straw colored, 7 = acceptable, 9 = dark green