Plan Ahead to Control Snow Mold This Year

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While it seems like the summer of 2009 came and went without much notice, or much warmth, 2010's version of summer is a different animal entirely. Temperatures have for the most part been warm and the humidities for the most part have been oppressive. This has led to a trying summer for those that manage golf course turf for a living, who are undoubtedly using the Labor Day weekend as a harbinger of cooler temperatures ahead. Well nothing says cooler temperatures like snow mold, so to cool yourself down as we near the end of summer let's review the latest and greatest methods for controlling snow mold.

The 2009-2010 University of Wisconsin Snow Mold Fungicide Trials were held at Milwaukee Country Club in Milwaukee, WI; Sentryworld Golf Course in Stevens Point, WI; Wawonowin Country Club in Champion, MI; Edina Country Club in Edina, MN; and The Legacy at Craguns Resort in Brainerd, MN. To see the final results and reports for all these sites, along with pictures of each treatment, please visit the "Research" page at the Turfgrass Diagnostic Lab's website (www.plantpath.wisc.edu/tdl). Disease pressure was quite low at Milwaukee and Edina, while pressure was extremely high at Wawonowin. Since the pressure at Sentryworld was more representative of what most golf course superintendents in the state face in a given winter, that report will be the focus here.

The Trial

Stevens Point, WI is located directly in the center of the state, approximately 2 hours due north of Madison. Sentryworld Golf Course is a high end public golf course designed by Robert Trent Jones, Jr. that opened for play in 1982. While the public might know it best for its flower hole (#16), or its annual ranking within or near the top 10 of Wisconsin's public courses, many turf management professionals know it as the long time host of the UW's snow mold trials. The trial itself is con-

	Treatment	Rate	Timing[a]	Dis Severity[b]	Quality[c]	Color[d]
1	Non treated Control			89.5 a	2.8 l	0.334 g
2	Emerald	0.13 OZ/M	Late	87.5 a	2.8 l	0.343 g
	Iprodione Pro	2.0 FL OZ/M	Late			
3	Emerald	0.13 OZ/M	Late	82.5 ab	2.8 l	0.359 g
	Iprodione Pro	3.0 FL OZ/M	Late			
4	Emerald	0.13 OZ/M	Late	61.3 bc	3.8 i-l	0.481 c-f
	Daconil Ultrex	1.8 OZ/M	Late			
5	Emerald	0.13 OZ/M	Late	40.0 cde	4.8 g-k	0.510 a-f
	Daconil Ultrex	3.25 OZ/M	Late			
6	Curalan EG	1.0 OZ/M	Late	71.3 ab	3.3 kl	0.370 g
7	BAS63700F	2.25 LB/M	Late	36.3 def	5.5 d-h	0.487 b-f
8	BAS63700F	3.0 LB/M	Late	21.3 d-g	6.0 b-h	0.494 a-f
9	Insignia	0.9 OZ/M	Late	66.3 b	3.8 i-l	0.461 ef
10	Insignia	0.9 OZ/M	Late	1.3 g	7.0 a-e	0.612 abc
	Trinity	1.0 FL OZ/M	Late			
11	Insignia SC	0.54 FL OZ/M	Late	0.5 g	7.3 a-d	0.604 a-d
	Trinity	1.0 FL OZ/M	Late			
	Daconil Ultrex	3.2 OZ/M	Late			
12	Insignia SC	0.54 FL OZ/M	Late	0.0 g	7.3 a-d	0.619 ab
	Trinity	1.0 FL OZ/M	Late			
	Iprodione Pro	4.0 FL OZ/M	Late			
13	Honor	0.83 OZ/M	Late	3.8 g	7.3 a-d	0.568 a-e
	Trinity	1.0 FL OZ/M	Late			
	Daconil Ultrex	3.2 OZ/M	Late			
14	Curalan EG	1.0 OZ/M	Early	0.0 g	7.5 abc	0.603 a-d
	Daconil Ultrex	3.2 OZ/M	Early			
	Insignia SC	0.54 FL OZ/M	Late			
	Trinity	1.0 FL OZ/M	Late			
	Daconil Ultrex	3.2 OZ/M	Late			
15	DPX-LEM 17-50	0.7 OZ/M	Late	6.8 g	6.8 a-e	0.588 a-e
16	DPX-LEM 17-50	0.9 OZ/M	Late	11.3 fg	6.3 a-g	0.600 a-d
17	DPX-LEM 17-50	1.1 OZ/M	Late	3.8 g	6.8 a-e	0.604 a-d
18	DPX-LEM 17-50	0.7 OZ/M	Late	0.8 g	7.0 a-e	0.597 a-e
	Daconil Ultrex	5.0 OZ/M	Late			
19	DPX-LEM 17-50	0.7 OZ/M	Late	11.3 fg	7.0 a-e	0.618 abc
	Chipco 26GT	4.0 OZ/M	Late			
20	Interface	4.0 FL OZ/M	Late	0.0 g	7.8 ab	0.600 a-d
	Triton Flo	0.85 FL OZ/M	Late			
21	Interface	5.0 FL OZ/M	Late	1.3 g	8.0 a	0.628 a
	Triton Flo	0.85 FL OZ/M	Late			
22	Interface	6.0 FL OZ/M	Late	0.0 g	8.0 a	0.605 a-d
	Triton Flo	0.85 FL OZ/M	Late			
23	Reserve	4.5 FL OZ/M	Late	0.0 g	7.8 ab	0.598 a-e
	Compass	0.25 OZ/M	Late			
24	Reserve	5.4 FL OZ/M	Late	0.0 g	7.8 ab	0.604 a-d
	Compass	0.25 OZ/M	Late			
25	Tartan	2.0 FL OZ/M	Late	0.0 g	7.5 abc	0.607 a-d
	Daconil Ultrex	5.0 OZ/M	Late			

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

[a] Early and late fungicide treatments were applied on Oct. 16th, 2009 and Nov. 6th, 2009, respectively

[b] Mean % diseased area

[c] Quality was visually rated on a scale of 1-9 where 1 = completely dead, 6 = acceptable, 9 = dark green

[d] Color was rated using a TCM 500 NDVI Turf Color Meter from Spectrum Technologies ®

Table 1: Snow mold disease severity, turfgrass quality, and turfgrass color as observed at Sentryworld Golf Course on March 24th, 2010.

Figure 1: While snow mold pressure was high at Sentryworld, as it was over much of the state, many different treatments provided excellent control.

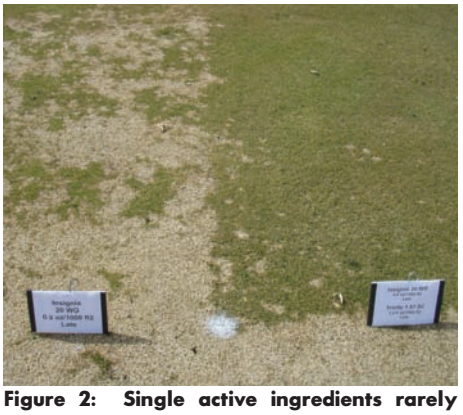

Figure 2: Single active ingredients rarely provide acceptable snow mold control in the upper Midwest, but when mixed with others the control increases dramatically. The treatment on the left is a single active ingredient that provides poor snow mold control, but when that same ingredient is mixed with another (which on its own also provides limited control), control increases significantly.

ducted on a 'Penneagle' creeping bentgrass nursery maintained at one half of one inch. Either one (late) or two (early and late) fungicide applications were made based on the specifications of the cooperator providing the material. Early applications were made on October 16th, 2009 and late applications were made on November 6th, 2009. Disease severity, turf quality, and color were recorded on March 24th, 2010. Disease severity was visually rated as percent disease, turfgrass quality was visually rated on a 1-9 scale with 6 being acceptable, and Normalized Difference Vegetative Index (turfgrass color) was rated using a TCM 500 NDVI Turf Color Meter® from Spectrum Technologies. Data was subjected to an analysis of variance and means were separated using Student Newman-Keuls test. Means for disease severity, turf quality and color are presented in the following tables for individual treatments. Fifty standard and experimental treatments were tested in the 2009-2010 trials, of which 46 are presented here (Table 1 and Table 1a page 20).

The Results and Discussion

Disease pressure at Sentryworld mirrored that observed around the state, which was for the most part quite high (Figure 1). Non treated controls averaged 89.5% disease, of which *T. ishikariensis* was the predominant snow mold pathogen observed. All treatments with the exception of the Emerald and

Iprodione Pro combinations (Trt 2 and 3) as well Curalan EG (Trt 6) provided a significant reduction in disease severity compared to the non treated control (Figure 2). Acceptable disease suppression was established as anything less than 5% disease, and several treatments failed to provide acceptable control. Granular products as well as those with only a single active ingredient were the ones most prone to breaking down, including PCNB applied at 10 fl oz/1000 ft^2. Treatments 12, 14, 20, 22-25, 27-29, 34, 42, 44, and 47-48 provided complete suppression while many more provided acceptable levels of control. Most of these treatments had 3 or in some cases 4 or 5 active ingredients in each treatment. One result observed at Wawonowin that is not shown in this trial is that splitting up the applications can increase control under heavy snow mold pressure. That is to say, spraying a lower rate (but not a half rate) at an early and a late timing can increase control over a higher rate made in one application. If you have had trouble with snow mold control in the past despite using what is generally regarded as an effective product, try spraying 3-4 weeks earlier than your normal application timing to knock down initial fungal inoculums earlier in the fall.

Differences in plot color and quality were also observed, though most products that provided excellent disease control provided statistically similar quality and color. One exception was the treatment containing PCNB (49), which caused a slight discoloration that recovered within 3 weeks of the initial rating.

The primary purpose of these fungicide trials is not to find the best products for controlling snow mold. The primary purpose is to find the best products for controlling snow mold at *your* facility. Every course is unique, and what works for the expectations and budget of one course might not make sense at another. There are dozens of different treatments in the table that can provide excellent or adequate protection at a cost that fits into nearly any budget. If you have any questions regarding the trials or what might work best at your facility, please don't hesitate to email (plkoch@wisc.edu) or call (608-845-2535) Paul at the TDL to discuss your options. In the meantime, if preparing for snow mold doesn't cool you down enough, football season is just days away.

Thanks to the host superintendents listed below for their willingness to let us perform this valuable service to the turfgrass industry on their property. Matt McKinnon at The Legacy at Craguns, Mike Powers at Edina Country Club, Glen Rochester at Wawonowin Country Club, Pat Sisk at Milwaukee Country Club, and Gary Tanko at Sentryworld Golf Course.

	Treatment	Rate	Timing[a]	Dis severity[b]	Quality[c]	Color[d]
26	Instrata	5.5 FL OZ/M	Late	2.5 g	7.3 a-d	0.548 a-e
27	Instrata	5.5 FL OZ/M	Early/Late	0.0 g	7.5 abc	0.584 a-e
28	Instrata	9.3 FL OZ/M	Late	0.0 g	7.3 a-d	0.557 a-e
29	Instrata	11 FL OZ/M	Late	0.0 g	7.3 a-d	0.585 a-e
30	Instrata	5.5 FL OZ/M	Early/Late	11.3 fg	7.0 a-e	0.564 a-e
	Fore	8.0 OZ/M	Early/Late			
31	Headway	1.5 FL OZ/M	Late	3.8 g	7.3 a-d	0.585 a-e
	Daconil Wstik	5.5 FL OZ/M	Late			
	Medallion	0.33 OZ/M	Late			
32	Concert	8.25 FL OZ/M	Late	1.3 g	7.3 a-d	0.548 a-e
	Headway	1.5 FL OZ/M	Late			
33	Interface	4.0 FL OZ/M	Late	2.5 g	7.5 abc	0.579 a-e
	Turfcide 400	8.0 FL OZ/M	Late			
34	Reserve	4.5 FL OZ/M	Late	0.0 g	7.8 ab	0.599 a-d
	Compass	0.2 OZ/M	Late			
35	SP 2169	1.41 FL OZ/M	Early/Late	62.5 bc	3.5 jkl	0.399 fg
36	SP 2169	1.41 FL OZ/M	Early/Late	42.5 cde	4.5 h-k	0.521 a-e
	Pentathlon LF	12.8 FL OZ/M	Early/Late			
37	SP 2169	2.82 FL OZ/M	Early/Late	35.0 def	5.0 f-j	0.526 a-e
38	SP 2169	2.82 FL OZ/M	Early/Late	18.8 efg	5.8 c-h	0.546 a-e
	Pentathlon LF	12.8 FL OZ/M	Early/Late			
39	Vitalonil	8.0 FL OZ/M	Late	36.3 def	4.8 g-k	0.471 def
	Daconil Ultrex	3.2 OZ/M	Late			
40	Tourney	0.37 OZ/M	Late	1.3 g	7.0 a-e	0.576 a-e
	Chipco 26GT	4.0 FL OZ/M	Late			
45	QP TM/C	6.0 OZ/M	Late	2.5 g	7.0 a-e	0.571 a-e
	QP Ipro	4.0 FL OZ/M	Late			
	QP Propiconazole	2.0 FL OZ/M	Late			
46	QP TM/C	6.0 OZ/M	Late	1.3 g	6.8 a-e	0.565 a-e
	QP Ipro	4.0 FL OZ/M	Late			
	QP Myclobutanil	2.4 FL OZ/M	Late			
47	QP Chlorothalonil	5.5 FL OZ/M	Late	0.0 g	7.3 a-d	0.567 a-e
	QP Ipro	4.0 FL OZ/M	Late			
	QP Propiconazole	2.0 OZ/M	Late			
48	QP Chlorothalonil	5.5 FL OZ/M	Late	0.0 g	7.3 a-d	0.567 a-e
	QP Ipro	4.0 FL OZ/M	Late			
	QP Myclobutanil	2.4 FL OZ/M	Late			
49	Turfcide 400	10 FL OZ/M	Late	20.0 d-g	5.3 e-i	0.544 a-e
50	Chipco 26GT	4.0 FL OZ/M	Late	8.8 g	5.8 c-h	0.605 a-d
	Daconil Ultrex	5.5 OZ/M	Late			

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

[a] Early and late fungicide treatments were applied on Oct. 16th, 2009 and Nov. 6th, 2009, respectively

[b] Mean % diseased area

[c] Quality was rated on a scale of 1-9 where 1 = completely dead, 6 = acceptable, 9 = dark green

[d] Color was rated using a TCM 500 NDVI Turf Color Meter from Spectrum Technologies ®

Table 1a