

Bayer Fungicides to Control Snow Mold on Fairways in Montana and Idaho 2013-2014 (Final Report)

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Snow mold control trials were conducted at 2 locations in the Intermountain Region of the PNW, a fairway at Meadow Lake Resort Golf Course in Columbia Falls, MT, and a fairway at the City of McCall Golf Course in McCall, ID. The fairways at each site had turfgrass stands with a mixture of creeping bentgrass, Kentucky bluegrass, perennial ryegrass, and annual bluegrass. Individual treatment plots were 6' x 7' with four replications in a randomized complete-block design. Treatments were applied 25 Oct 13 and 30 Oct 13 at McCall and Columbia Falls, respectively. Fungicides were applied at 80 GPA with a bicycle-wheeled CO₂ pressurized (40 psi) sprayer with 11008 flat fan TeeJet nozzles. The GPS coordinates and climatic conditions at time of application for each site are listed in Table 1. Columbia Falls had snow cover totaling approximately 125 days from December 2013 to the end of March 2014. Continuous snow cover lasted from the beginning of December 2013 through the end of April 2014 (approx. 150 days) at McCall. Individual plots were evaluated for pink (*Microdochium nivale*) and/or gray (*Typhula spp.*) snow mold disease severity (% area infected). Overall percentage of pink snow mold was 65% and 80% at Columbia Falls and McCall, respectively; gray snow mold was 35% and 20%. In addition at the McCall site winter injury was also included in the disease rating. Turfgrass quality was rated on a scale from 1 to 9; 9 = excellent and 6 = acceptable, 11 Apr 14 at Columbia Falls, and 2 May 14 at McCall.

At Meadow Lake Resort Golf Course, disease pressure was moderate, with the check infected with approximately 20% both pink and gray snow mold (Table 2). It was estimated that the ratio of pink to gray snow mold was 65:35. All treatments resulted in significant control of snow mold. Interface at 4 or 5 fl oz/M + Mirage SC at 1.5 or 2 fl oz/M all provided very good snow mold control (<2.3 % of area infected) and very good turfgrass quality (>6.6 rating). Treatments SP102000028296 5, 6, or 8 fl oz/M + Mirage SC at 1.5 fl oz/M also performed similarly. Turfcide 400 at 12 fl oz/M performed just as well as any of the Interface or SP102000028296 + Mirage SC treatments. Figures 1 - 4 show the various treatments.

At McCall, rating for snow mold infection was difficult to determine since many of the treatments also had varying degrees of winter injury as well (Table 3). Snow mold disease and winter injury were rated together in each individual plot. As one may expect there was a lot of variation in the data taken, as exemplified by not being able to detect a difference between 21.5% and 57.5% disease + winter injury. Statistically there is no difference among any of the treatments in terms of disease + winter injury. However, SP102000028296 at 8 fl oz/M had significantly higher turfgrass quality

(5.8) compared to most of the other treatments and also numerically had the lowest disease + winter injury (21.5% of the area affected). Figures 5 - 11 show the various treatments.

Overall, at Meadow Lake Resort Golf Course in Columbia Falls, all Interface or SP102000028296 + Mirage SC treatments resulted in very good control and turfgrass quality. However, Turfcide 400 at 12 fl oz/M performed just as well.

With so much winter injury at McCall it is impossible to make any clear determination of the treatment effects as to how effective they are at controlling snow mold.

Table 1. The GPS coordinates and climatic conditions at application at each site.

GPS coordinates

Location	Golf Course	Latitude	Longitude	Elevation
Columbia Falls, MT	Meadow Lake Resort GC	N 48° 23' 2.6"	W 114° 12' 8.5"	3100'
McCall, ID	City of McCall GC	N 44° 55' 0.53"	W 116° 4' 55.6"	4813'

Climate data at application

Location	Golf Course	Date	Air temp (°F)	Soil temp 2" (°F)	RH (%)	Wind (Direction/Speed)	Weather conditions
Columbia Falls, MT	Meadow Lake Resort GC	10/31/2013	44	34	51%	W / 0-3 mph	Sunny
McCall, ID	City of McCall GC	10/25/2013	53	45	45%	NW / 1-3 mph	Sunny

Table 2. The effect of fungicides on a fairway to control pink and gray snow mold at Meadow Lake golf course in Columbia Falls, MT. Rated on 11 Apr 2014.

Treatment	Form. Type	AI Conc.	Rate (fl oz/M)	Snow mold	
				(% area infected)	*Turfgrass quality
Interface (iprodione + trifloxystrobin) + Mirage SC (tebuconazole)	SC SC	24.54 240	4 2	0.3 b**	6.9 a
SP102000028296 + Mirage SC (tebuconazole)	SC SC	25 240	5 1.5	1.3 b	6.8 ab
Interface (iprodione + trifloxystrobin) + Mirage SC (tebuconazole)	SC SC	24.54 240	5 1.5	1.3 b	6.6 ab
SP102000028296 + Mirage SC (tebuconazole)	SC SC	25 240	8 1.5	1.5 b	6.5 ab
Turfcide 400 (PCNB)			12	1.5 b	6.5 ab
Interface (iprodione + trifloxystrobin) + Mirage SC (tebuconazole)	SC SC	24.54 240	5 2	2.3 b	6.6 ab
SP102000028296 + Mirage SC (tebuconazole)	SC SC	25 240	6 1.5	4.8 b	6.0 b
Untreated			0	20.5 a	4.5 c

*Turfgrass quality rated 1 to 9; 9 = excellent.

**Means within columns followed by the same letter are not significantly different. LSD (P = 0.05).

Fig. 1. Snow mold fungicide treatments on a fairway at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 11 Apr 2014.

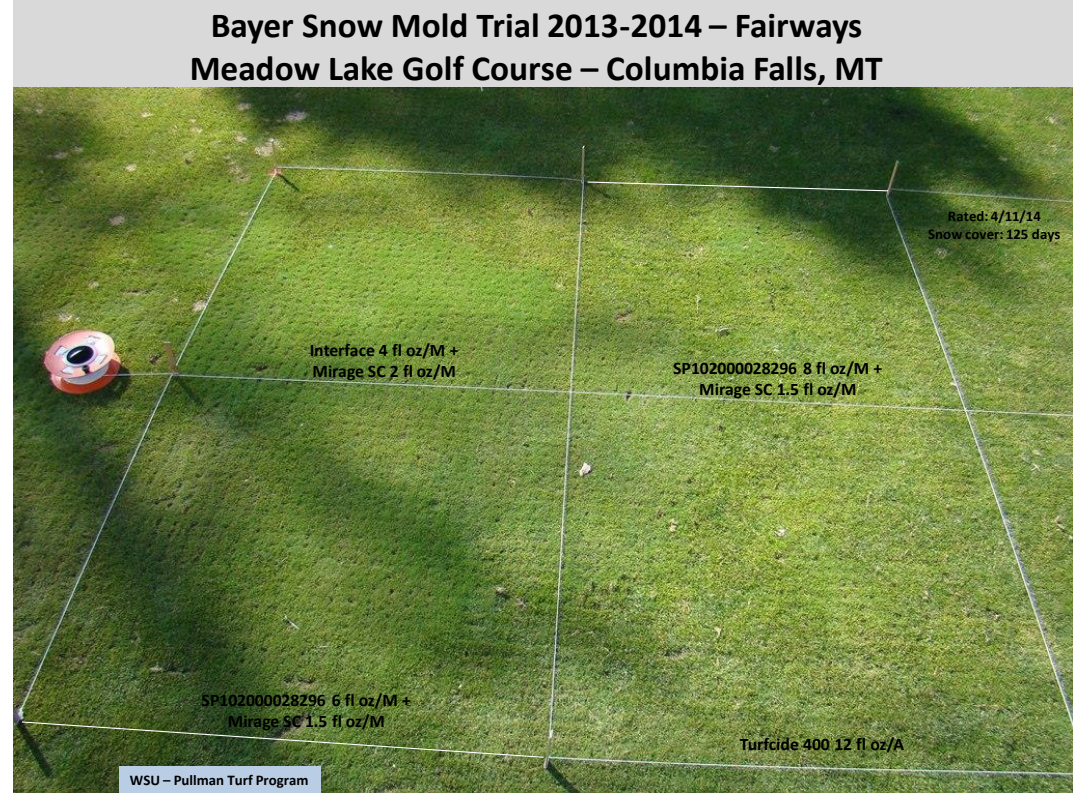


Fig. 2. Snow mold fungicide treatments on a fairway at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 11 Apr 2014.



Fig. 3. Snow mold fungicide treatments on a fairway at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 11 Apr 2014.



Fig. 4. Snow mold fungicide treatments on a fairway at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 11 Apr 2014.

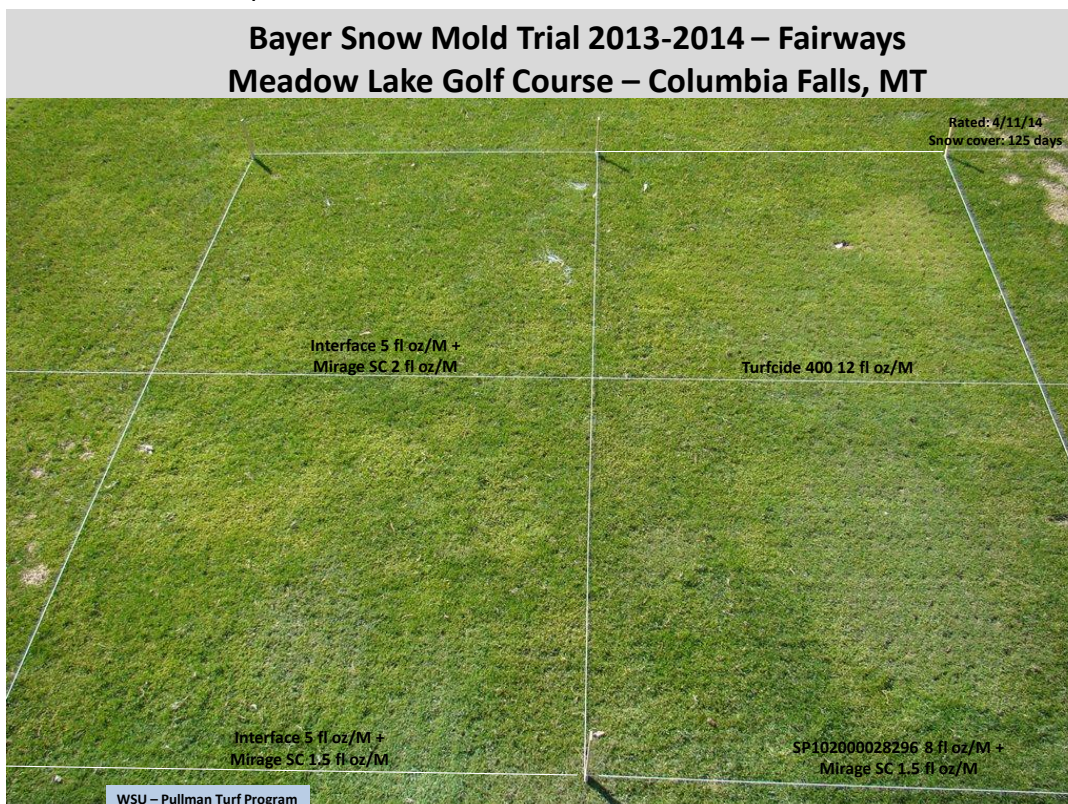


Table 3. The effect of fungicides on a fairway to control pink and gray snow mold at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

Treatment	Form. Type	Rate (fl oz/M)	Snow mold + winter injury	
			(% area infected)	*Turfgrass quality
SP102000028296 + Mirage SC (tebuconazole)	SC SC	8 2	21.5	5.8 a
SP102000028296 + Mirage SC (tebuconazole)	SC SC	6 2	27.5	4.4 ab
Turfcide 400 (PCNB)		12	35.0	3.4 bc
SP102000028296 + Mirage SC (tebuconazole)	SC SC	5 2	40.0	3.6 bc
Untreated		0	45.0	3.0 bc
Interface (iprodione + trifloxystrobin) + Mirage SC (tebuconazole)	SC SC	6 2	57.5	2.6 c

*Turfgrass quality rated 1 to 9; 9 = excellent.

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**Means within columns followed by the same letter are not significantly different. LSD (P = 0.05).

Fig. 5. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.



Fig. 6. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.



Fig. 7. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

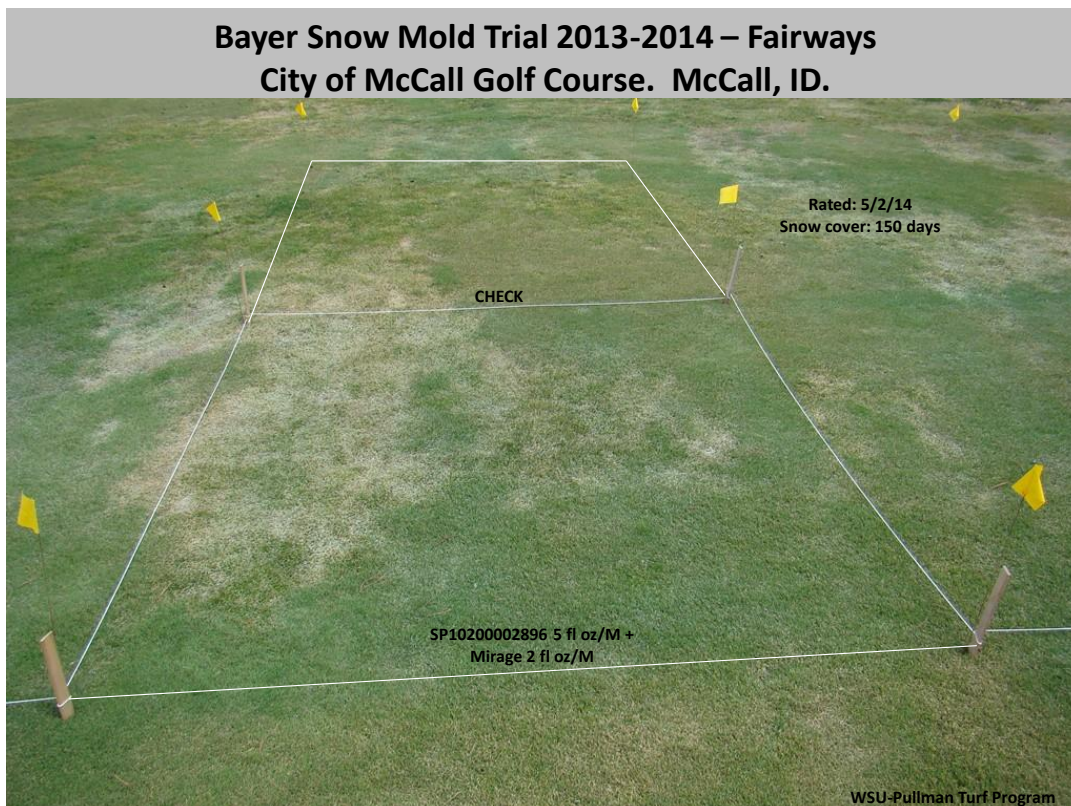


Fig. 8. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

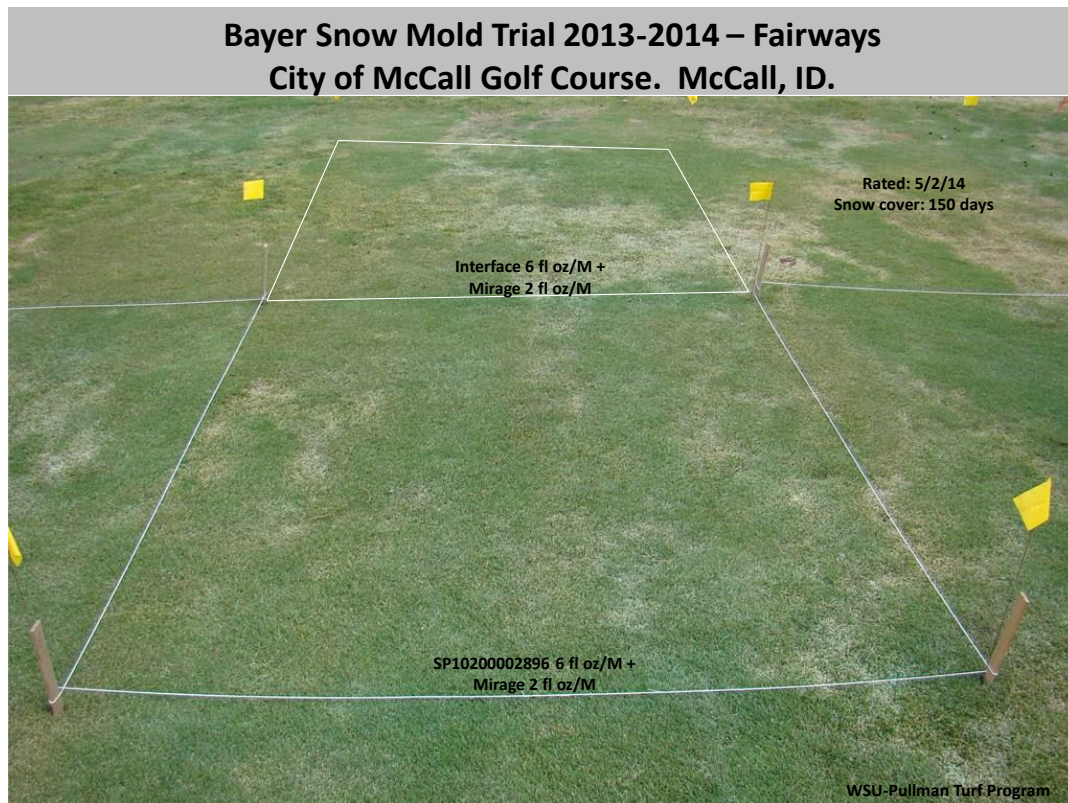


Fig. 9. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

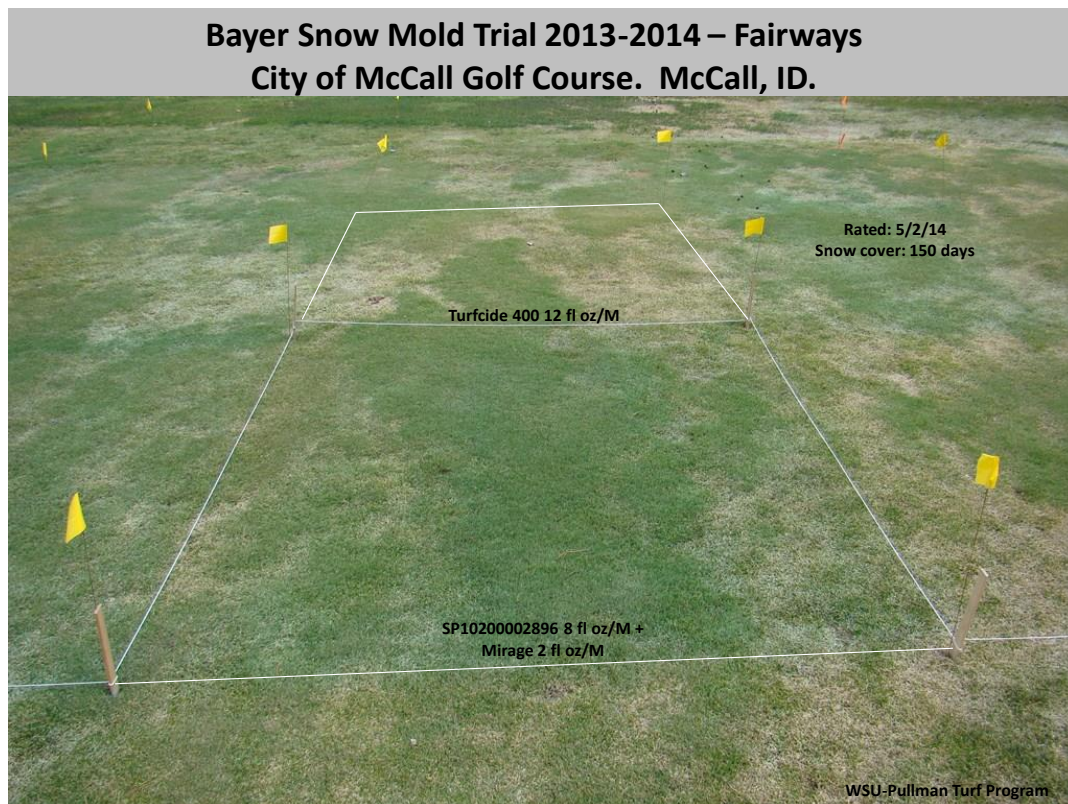


Fig. 10. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

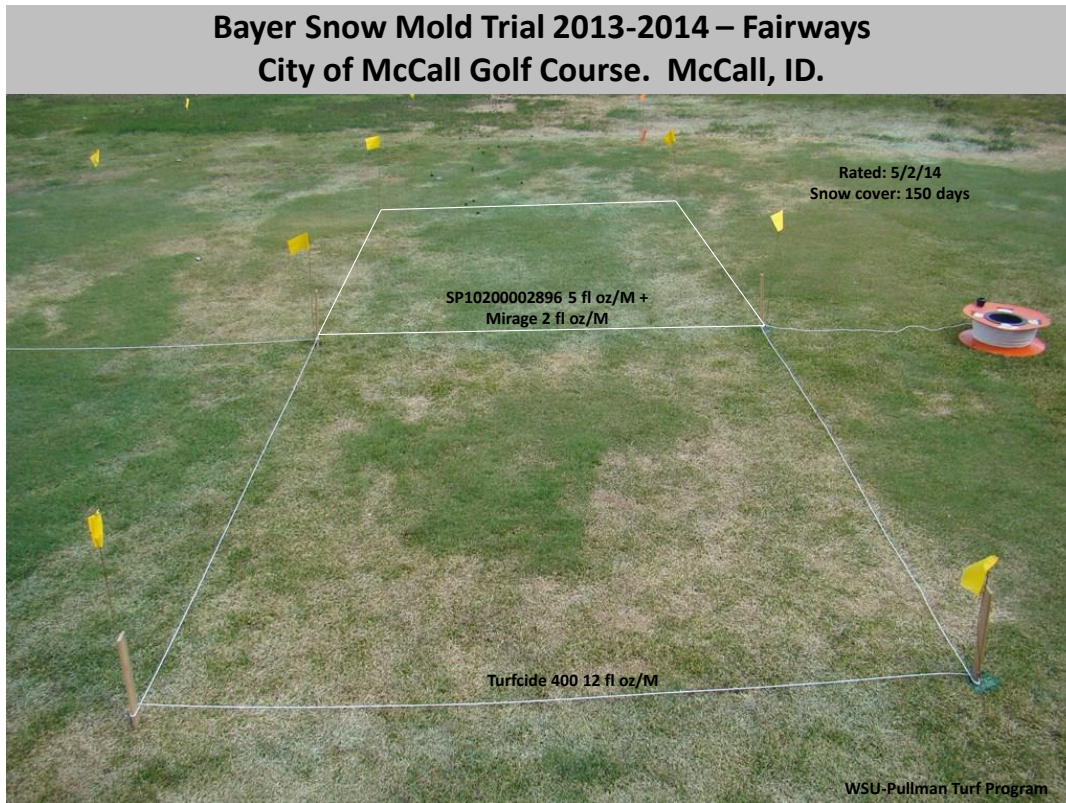


Fig. 11. Snow mold fungicide treatments on a fairway at the City of McCall Golf Course in McCall, ID. Rated on 2 May 2014.

