AMVAC-Turfcide 400 and AMV4820 alone, combined with other fungicides, or compared to other fungicides to control pink and gray snow mold on putting greens 2012-13

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June 5, 2013

A snow mold control trial was conducted on a green at Meadow Lake Resort Golf Course in Columbia Falls, MT. The green is a mixed stand of 'Penncross' creeping bentgrass and annual bluegrass. Individual treatment plots were 6' x 7' with four replications in a randomized complete-block design. Treatments were applied 2 Nov 2012. Fungicides were applied at 80 GPA with a bicycle-wheeled CO_2 pressurized (40 psi) sprayer with 11008 flat fan TeeJet nozzles. GPS coordinates and climatic data at time of application are in Table 1. Snow cover totaled approximately 110 days from December 2011 to March 2012. On 28 Mar 2013, individual plots were evaluated for pink (*Microdochium nivale*) and/or gray (*Typhula spp.*) snow mold disease severity (% area infected), turfgrass quality rated on a scale from 1 to 9; 9 = excellent and 6 = acceptable, and color rated on a scale from 1 to 9; 9 = dark green.

Disease pressure was low with the plot area of the Check infected with 12% snow mold (Table 2). The percentage of pink and gray snow mold in the Check was estimated to be 65% and 35%, respectively. All treatment resulted in complete or nearly complete disease control and significantly better control compared to the Check. However, there were significant differences in turfgrass quality and color among the treatments. Interface 4 fl oz/M alone or combined with Triton FLO 0.85 fl oz/M, AMV4820 8 fl oz/M, or Turfcide 400 8 fl oz/M resulted in the best turfgrass quality and color. Insignia 0.7 fl oz/M alone resulted in nearly complete disease control with turfgrass quality and color equal to Interface 4 fl oz/M. However, Insignia 0.7 fl oz/M tank mixed with Trinity 1 fl oz/M, AMV4820 8 fl oz/M, or Turfcide 400 8 fl oz/M resulted in significantly lower turfgrass quality and color compared to Insignia alone. Instrata 7 or 9.4 fl oz/M resulted in significantly lower turfgrass quality and color compared to Interface 4 fl oz/M or Insignia 0.7 fl oz/M. Tank mixing Instrata 7 fl oz/M with AMV4820 8 fl oz/M or Turfcide 400 8 fl oz/M did not result in any change of turfgrass quality or color compared to Instrata alone.

All AMV4820 and Turfcide 400 treatments applied alone resulted in excellent disease control (Tables 2 and 3). In general, as rate increased turfgrass quality and color decreased. However, there were no significant differences between the PCNB products when compared at the same rate for disease control, turfgrass quality, or color, even though there was a tendency for turfgrass quality and color to be slightly higher with AMV4820. Figs. 1 to 6 show fungicide treatments in reps 1 and 2. Fig. 7 shows entire study area.

Overall, with low disease pressure all treatments in this study resulted in excellent snow mold control. Interface treatments resulted in the best turfgrass quality and color. Not surprisingly, since Bayer's Interface contains Stressguard. Insignia 0.7 fl oz/M performed as good as the Interface treatments. However, Insignia tank mixed with other products resulted in lower turfgrass quality and color. Tank mixing other products with Instrata did not change turfgrass quality or color. AMV4820 being safer to use than Turfcide 400 was not evident in this study, even though there was a tendency for AMV4820 to have slightly higher turfgrass quality and color when compared at the same rate.

Table 1. GPS coordinates and climatic data and at time of application.

LOCATION: Columbia Falls, MT. Meadow Lake Resort Golf Course.

GPS coordinates: Lat.: 48° 23' 19.2" N

Long.: 114° 12' 12.0" W

Elev.: 3164'

Application date: 11/2/12

Air temperature	9.4°C
Soil temp (2")	7.8°C
RH	77%
Wind (SW)	0-2 mph

Table 2. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013.

Product	Active Ingredient	Formulation	Product/A	Product /1,000 ft^2	Snow mold (% area infected)	*Turfgrass quality	**Turfgrass color
Interface	iprodione + trifloxystrobin	2.27SC	1.36 gal	4 fl.oz.	0.0 c***	7.0 a	7.0 a
Interface + Triton FLO	iprodione + trifloxystrobin triticonazole	2.27SC 3F	1.36 gal 37 fl.oz.	4 fl.oz. 0.85 fl.oz.	0.0 c	7.0 a	7.0 a
Interface + AMV4820	iprodione + trifloxystrobin PCNB	2.27SC 4A	1.36 gal 2.72 gal	4 fl.oz. 8 fl.oz.	0.0 c	6.8 a	6.8 a
Interface + Turfcide 400	iprodione + trifloxystrobin PCNB	2.27SC 400 (4F)	1.36 gal 2.72 gal	4 fl.oz. 8 fl.oz.	0.0 c	6.5 ab	6.5 ab
Insignia + AMV4820	pyraclostrobin PCNB	2.08SC 4A	30.5 fl.oz. 2.72 gal	0.7 fl.oz. 8 fl.oz.	0.0 c	6.0 bc	6.0 bc
AMV4820	PCNB	4A	2.72 gal	8 fl.oz.	0.0 c	5.5 cd	5.5 cde
Insignia + Turfcide 400	pyraclostrobin PCNB	2.08SC 400 (4F)	30.5 fl.oz. 2.72 gal	0.7 fl.oz. 8 fl.oz.	0.0 c	5.3 de	5.0 efg
AMV4820	PCNB	4A	4.08 gal	12 fl.oz.	0.0 c	5.2 de	5.2 defg
Instrata + Turfcide 400	chlorothalonil + propiconazole + fludioxonil PCNB	3.591L 4F	2.38 gal 2.72 gal	7 fl.oz. 8 fl.oz.	0.0 c	5.0 def	5.0 efg
Instrata + AMV4820	chlorothalonil + propiconazole + fludioxonil PCNB	3.591L 4A	2.38 gal 2.72 gal	7 fl.oz. 8 fl.oz.	0.0 c	5.0 def	5.0 efg
Instrata	chlorothalonil + propiconazole + fludioxonil	3.591L	3.2 gal	9.4 fl.oz.	0.0 c	4.8 ef	5.0 efg
Turfcide 400	PCNB	400 (4F)	5.45 gal	16 fl.oz.	0.0 c	4.8 ef	4.8 fgh
Instrata	chlorothalonil + propiconazole + fludioxonil	3.591L	2.38 gal	7 fl.oz.	0.0 c	4.8 ef	4.8 fgh
AMV4820	PCNB	4A	10.89 gal	32 fl.oz.	0.0 c	4.8 ef	4.7 gh
Turfcide 400	PCNB	400 (4F)	10.89 gal	32 fl.oz.	0.2 c	4.5 f	4.3 h
Insignia	pyraclostrobin	2.08SC	30.5 fl.oz.	0.7 fl.oz.	0.3 bc	6.5 ab	6.5 ab
Turfcide 400	PCNB	400 (4F)	2.72 gal	8 fl.oz.	0.3 bc	5.3 de	5.3 def
Turfcide 400	PCNB	400 (4F)	4.08 gal	12 fl.oz.	0.3 bc	4.8 ef	4.8 fgh
AMV4820	PCNB	4A	5.45 gal	16 fl.oz.	0.5 bc	5.3 de	5.3 def
Insignia + Trinity	pyraclostrobin triticonazole	2.08SC 1.69L	30.5 fl.oz. 43.56 fl.oz.	0.7 fl.oz. 1 fl.oz.	1.2 b	5.5 cd	5.7 cd
Check				0	12.3 a	3.2 g	5.7 cd

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

** Turfgrass color rated 1 to 9; 9 = dark green.

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

Table 3. Comparison of AMV4820 to Turfcide 400 for pink and gray snow mold control on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013.

Product	Active Ingredient	Formulation	Product/A	Product /1,000 ft^2	Snow mold (% area infected)	*Turfgrass quality	**Turfgrass color
AMV4820	PCNB	4A	2.72 gal	8 fl.oz.	0.0 c	5.5 cd	5.5 cde
Turfcide 400	PCNB	400 (4F)	2.72 gal	8 fl.oz.	0.3 bc	5.3 de	5.3 def
AMV4820	PCNB	4A	4.08 gal	12 fl.oz.	0.0 c	5.2 de	5.2 defg
Turfcide 400	PCNB	400 (4F)	4.08 gal	12 fl.oz.	0.3 bc	4.8 ef	4.8 fgh
AMV4820	PCNB	4A	5.45 gal	16 fl.oz.	0.5 bc	5.3 de	5.3 def
Turfcide 400	PCNB	400 (4F)	5.45 gal	16 fl.oz.	0.0 c	4.8 ef	4.8 fgh
AMV4820	PCNB	4A	10.89 gal	32 fl.oz.	0.0 c	4.8 ef	4.7 gh
Turfcide 400	PCNB	400 (4F)	10.89 gal	32 fl.oz.	0.2 c	4.5 f	4.3 h
Check				0	12.3 a	3.2 g	5.7 cd

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

** Turfgrass color rated 1 to 9; 9 = dark green.

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

Fig. 1. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013.

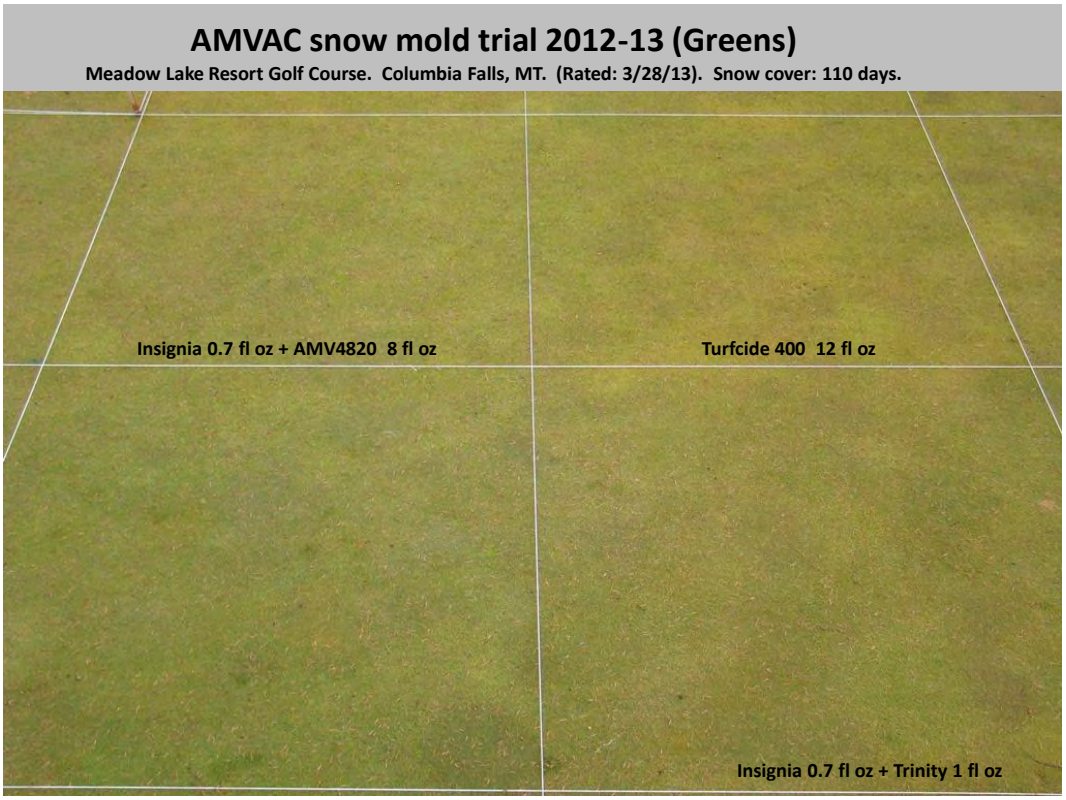

Fig. 2. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013.

Fig. 3. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013

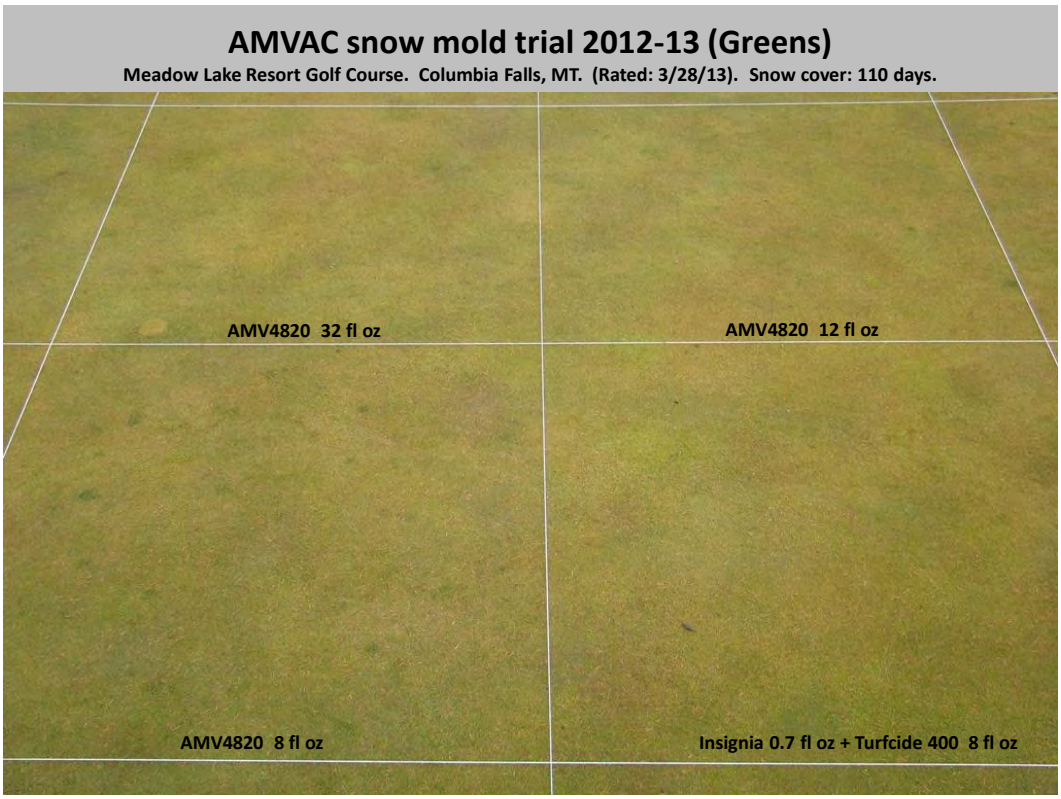

Fig. 4. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013

Fig. 5. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013

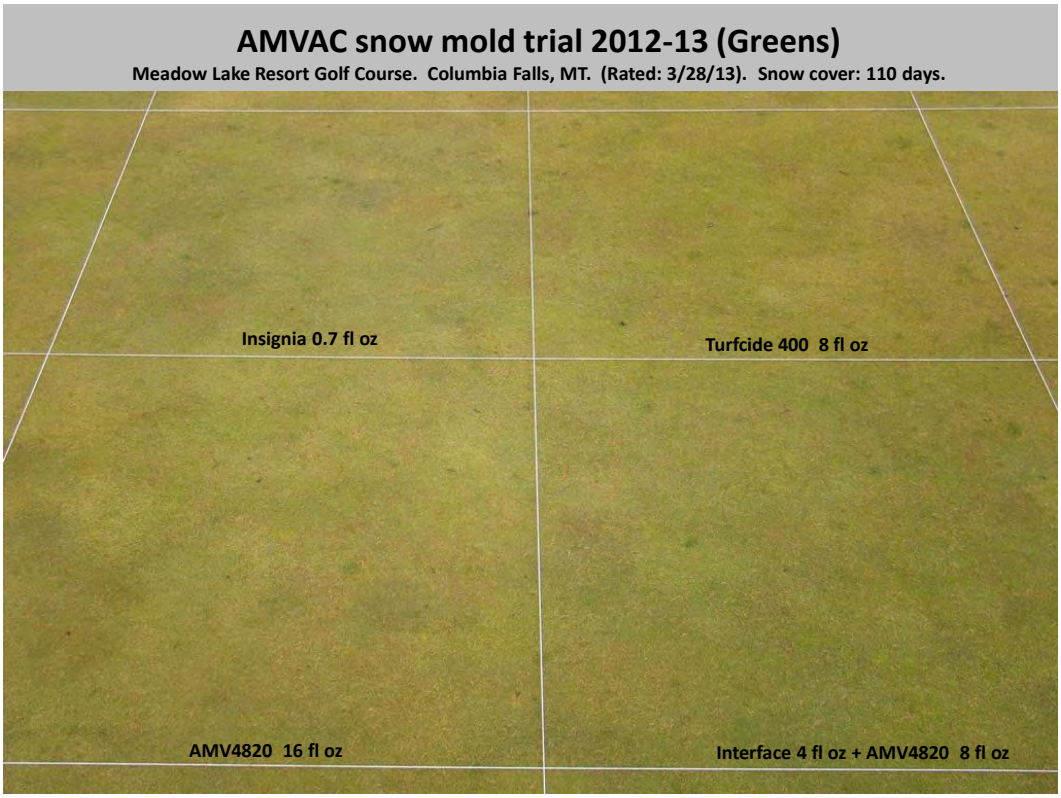

Fig. 6. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013

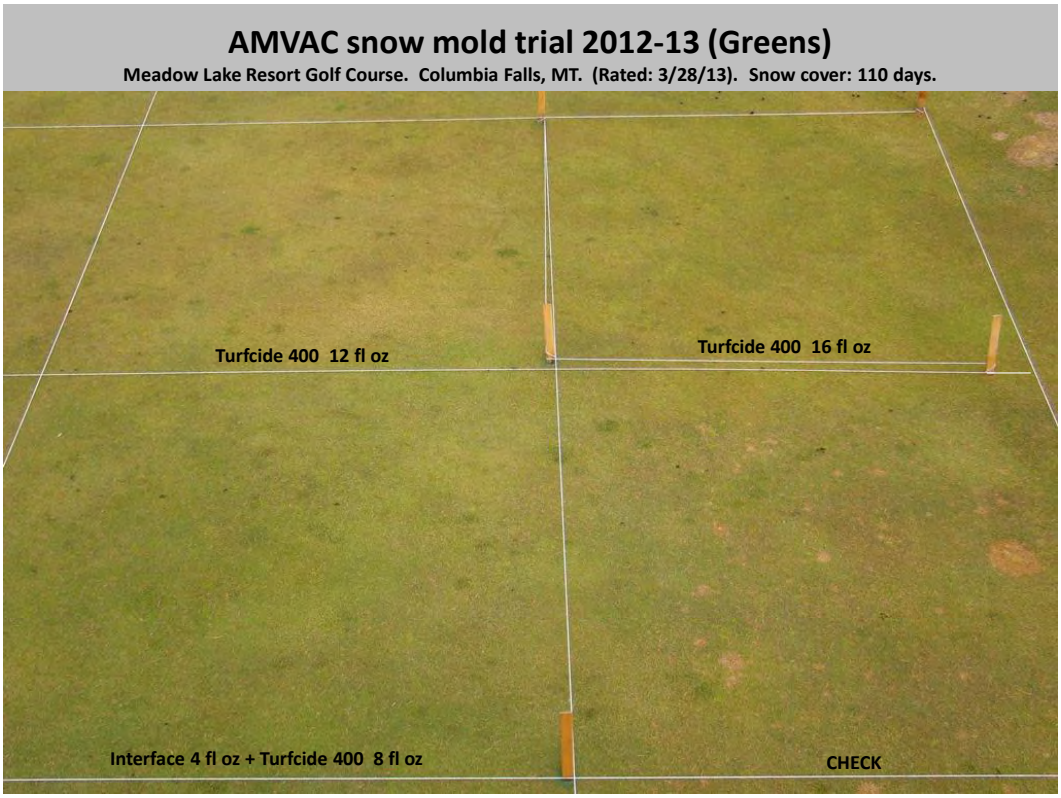

Fig.7. The effect of fungicides to control pink and gray snow mold on a putting green at Meadow Lake Resort Golf Course in Columbia Falls, MT. Rated on 28 Mar 2013. Overall view of entire study.