Evaluation of Fungicides from Syngenta to Control Pink and Gray Snow Mold on Putting Greens in Idaho and Washington 2008-09.

Protocol #: F08-DKM-T-10
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Snow mold control trials were conducted at 3 different locations in the Intermountain Region of the PNW, on a practice green at the City of McCall Golf Course in McCall, ID, on a nursery green at the Chewelah Golf and Country Club in Chewelah, WA, and on a research green at the WSU Turfgrass and Agronomy Research Center (TARC) in Pullman, WA. The practice green at McCall is a stand of creeping bentgrass/annual bluegrass, the nursery green at Chewelah is a push-up green covered with 3" to 4" of sand with a mixed stand of 'Penncross' creeping bentgrass and annual bluegrass, and the research green at Pullman is a pure stand of 'T-1' creeping bentgrass grown on an USGA specification putting green. Individual treatment plots were 6' x 7' with three replications in a randomized complete-block design. Treatments were applied 23 Oct 08, 31 Oct 08, and 19 Nov 08 at McCall, Chewelah, and Pullman, respectively. Fungicides were applied at 80 GPA with a bicycle-wheeled CO_2 pressurized (40 psi) sprayer with 11008 flat fan TeeJet nozzles. At Pullman, snow cover was intermittent throughout the winter from the middle of Dec 08 through 17 Mar 08 (approx. 43 days). Continuous snow cover was from 9 Dec 08 to 10 Apr 08 (approx. 122 days) at Chewelah and from mid Nov 08 to 7 April 08 at McCall (approx. 143 days). At McCall, snow was not allowed to melt naturally. On April 7 approximately 2 feet of snow was mechanically removed from the green and plots were rated that day. Individual plots were evaluated for pink (*Microdochium nivale*) and/or gray (*Typhula spp.*) snow mold disease severity (% area infected) and turfgrass quality (rated on a scale of 1-9; 9 = excellent) on 18 Mar 09 at Pullman, 13 Apr 09 at Chewelah, and 7 Apr 09 at McCall.

The Pullman site experienced normal snow mold pressure with intermittent snow cover during the winter. The non-treated control had 18.1 % area infected with pink snow mold (*M. nivale*) (Table 1). All treatments resulted in very good to excellent snow mold control and had similar turfgrass quality. Figures 1, 2, 3, and 4 show the various treatments at Pullman, WA.

At Chewelah, the non-treated control had 63.3 % area infected with roughly 40 % pink (*M. nivale*) and 60 % gray (*Typhula spp.*) snow mold (Table 2). *Typhula incarnata* sclerotia were found in the control plots but no *T. ishikariensis* sclerotia. All treatments had significantly less disease than the check. Instrata 9 fl oz/M and Headway 5 fl oz/M + Daconil Ultrex 5 oz/M had the highest turfgrass quality of all treatments. Figures 5, 6, 7, and 8 show the various fungicide treatments at Chewelah, WA.

At McCall, the site was rated just hours after nearly 2 feet of snow was removed from the plot area. The non-treated control had 30 % area infected with roughly 50% pink (*M. nivale*) and 50% gray (*Typhula spp.*) snow mold (Table 3). All fungicide treatments resulted in complete disease control and very good turfgrass quality. Figures 9, 10, 11, 12, and 13 show the various treatments at McCall, ID.

Overall, Instrata 9 fl oz/M alone, at all 3 sites, resulted in excellent snow mold control, therefore Instrata treatments with additional Medallion 0.33 oz/M or Heritage 0.2 oz/M added would not be recommended. Concert 8 fl oz/M combined with Heritage 0.2 oz/M or Medallion 0.33 oz/M did perform better, although not significantly, compared to Concert 8 fl oz alone. Similarly, Headway 5 fl oz/M combined with Medallion 0.33 oz/M or Daconil Ultrex 5 oz/M did perform better, although not significantly, compared to Headway 5 fl oz/M alone.

Table 1. The effect of several fungicide treatments to control pink snow mold. Pullman, WA. 2009.

Fungicide treatment	Rate (oz or fl oz/M)	Disease (% area infected)	Turfgrass quality**
Instrata (Propiconazole + Fludioxonil + Chlorothalonil)	9 fl oz	0.0 a*	4.3 a
Headway (Propiconazole + Azoxystrobin) + Medallion (Fludioxonil)	5 fl oz 0.33 oz	0.0 a	4.0 a
Concert (Propiconazole + Chlorothalonil) + Heritage (Azoxystrobin)	8 fl oz 0.2 oz	0.3 a	4.7 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Heritage (Azoxystrobin)	9 fl oz 0.2 oz	0.3 a	4.3 a
Headway (Propiconazole + Azoxystrobin) + Daconil Ultrex (Chlorothalonil)	5 fl oz 5 oz	0.7 a	4.3 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Medallion (Fludioxonil)	9 fl oz 0.33 oz	1.0 a	4.3 a
Concert (Propiconazole + Chlorothalonil) + Medallion (Fludioxonil)	8 fl oz 0.33 oz	1.3 a	4.0 a
Headway (Propiconazole + Azoxystrobin)	5 fl oz	1.7 a	4.0 a
Concert (Propiconazole + Chlorothalonil)	8 fl oz	3.7 a	4.0 a
Check	0	18.7 b	2.7 b

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

**Turfgrass quality rated from 1 to 9, with 9 = excellent.

Figure 1. Syngenta snow mold fungicide treatments at Pullman,WA. 2009.

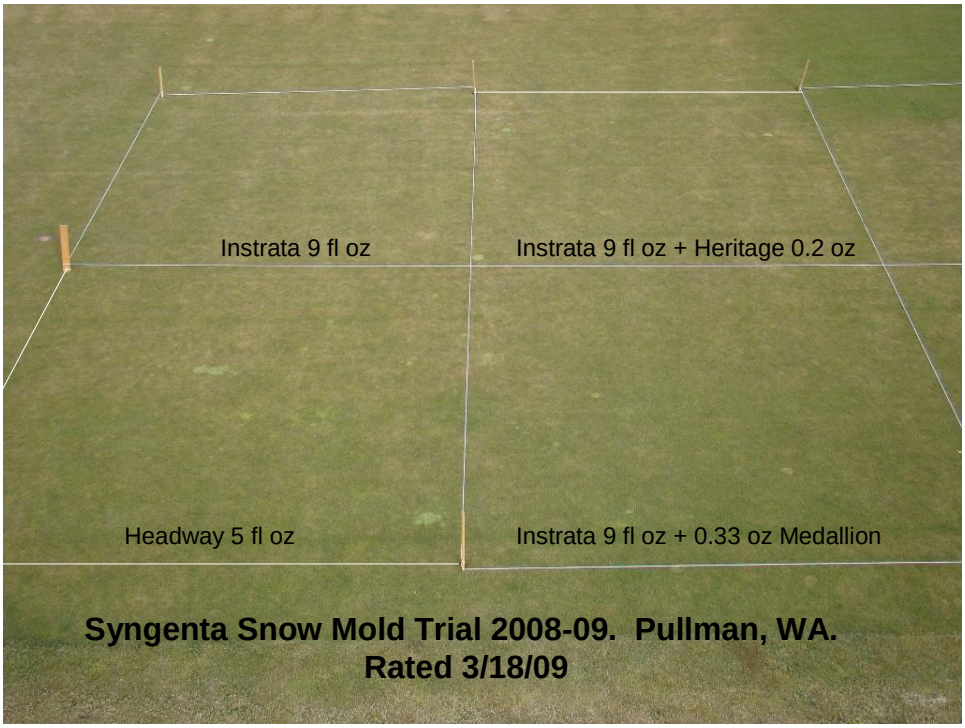

Figure 2. Syngenta snow mold fungicide treatments at Pullman,WA. 2009.

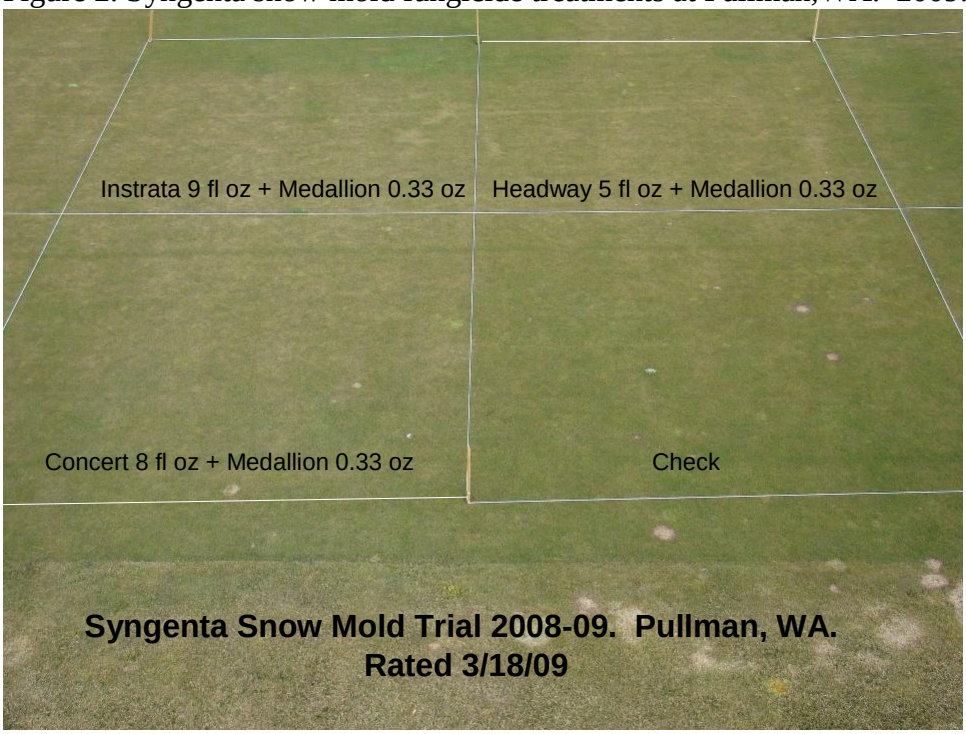

Figure 3. Syngenta snow mold fungicide treatments. Pullman, WA. 2009.

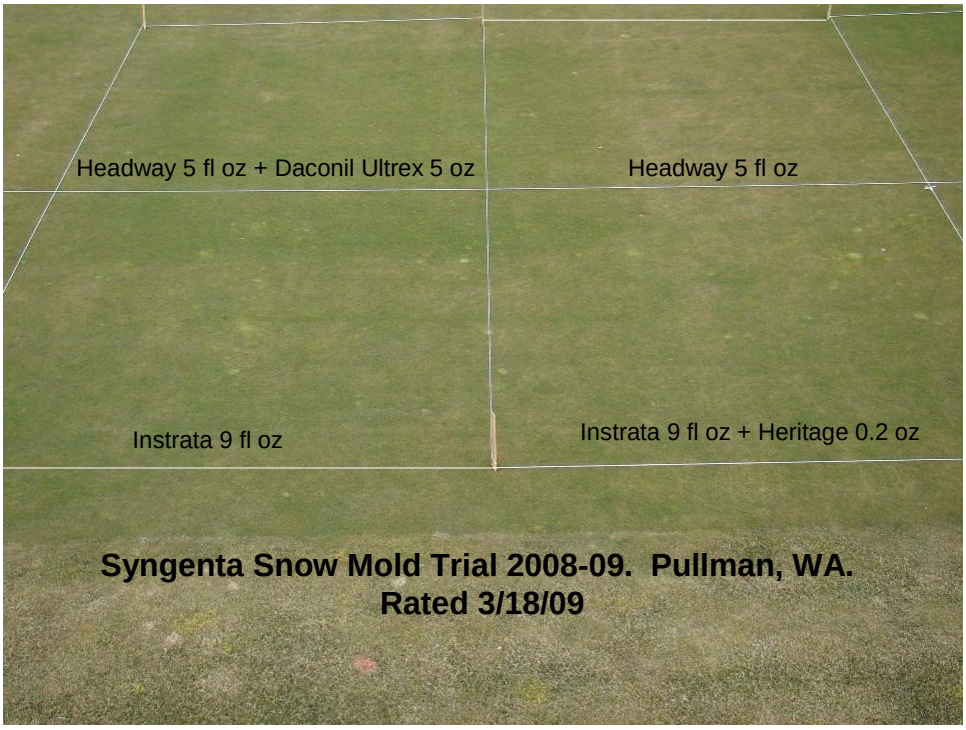

Figure 4. Syngenta snow mold fungicide treatments. Pullman, WA. 2009.

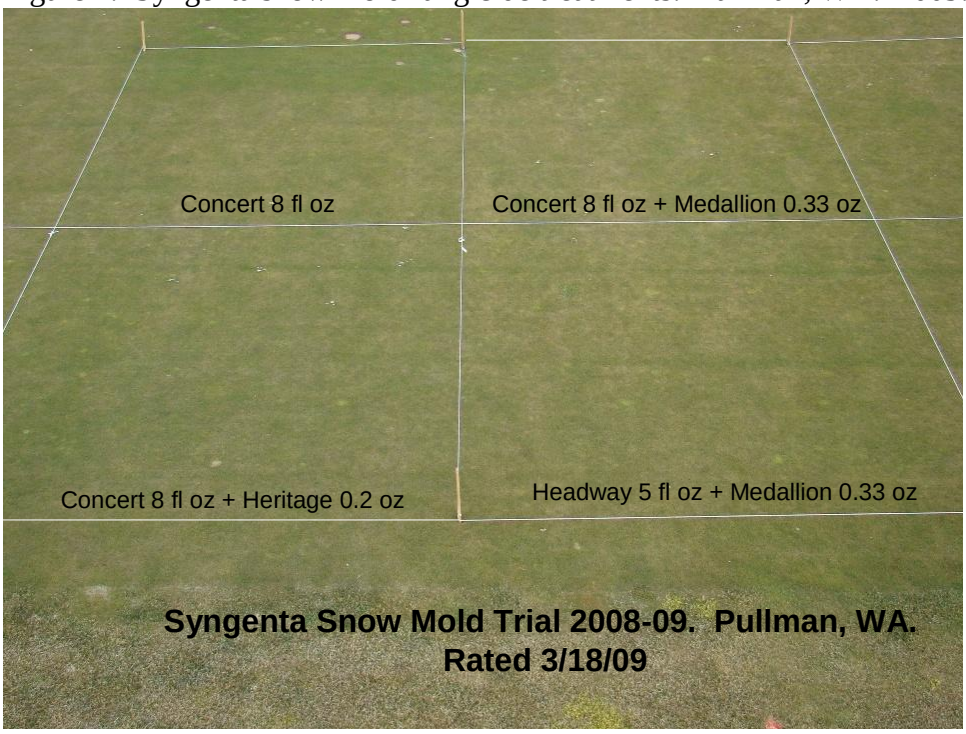

Table 2. The effect of several fungicide combinations on pink and gray snow mold. Chewelah, WA. 2009.

Fungicide treatment	Rate (oz or fl oz/M)	Disease (% area infected)	Turfgrass quality**
Instrata (Propiconazole + Fludioxonil + Chlorothalonil)	9 fl oz	0.0 a*	6.3 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Heritage (Azoxystrobin)	9 fl oz 0.2 oz	0.0 a	6.0 ab
Headway (Propiconazole + Azoxystrobin) + Daconil Ultrex (Chlorothalonil)	5 fl oz 5 oz	0.3 a	6.3 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Medallion (Fludioxonil)	9 fl oz 0.33 oz	1.0 a	5.7 ab
Headway (Propiconazole + Azoxystrobin) + Medallion (Fludioxonil)	5 fl oz 0.33 oz	2.7 a	5.3 b
Headway (Propiconazole + Azoxystrobin)	5 fl oz	3.7 a	5.7 ab
Check	0	63.3 b	1.3 c

*Means within a column followed by the same lettter are not significantly different. LSD *P* = 0.05.

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

Figure 5. Syngenta snow mold fungicide treatments Chewelah, WA. 2009.

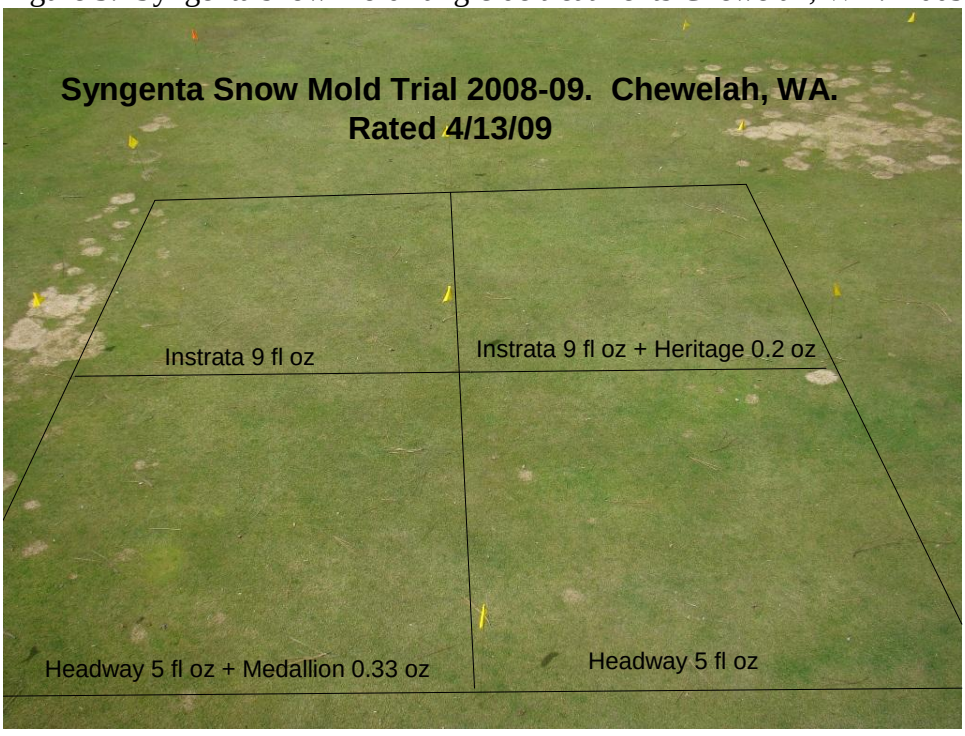

Figure 6. Syngenta snow mold fungicide treatments Chewelah, WA. 2009.

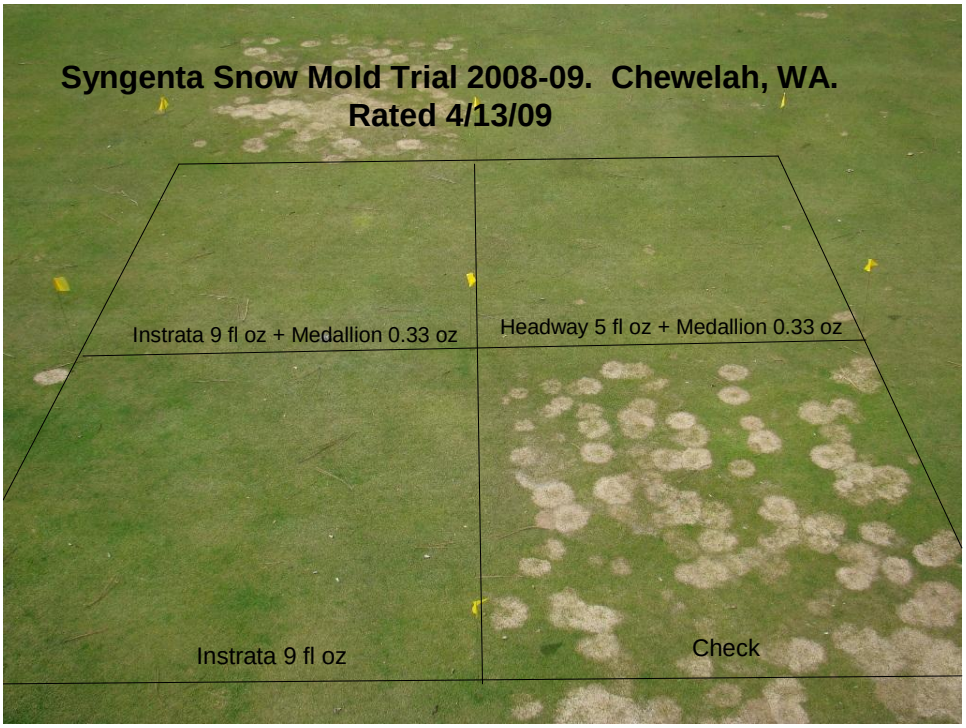

Figure 7. Syngenta snow mold fungicide treatments Chewelah, WA. 2009.

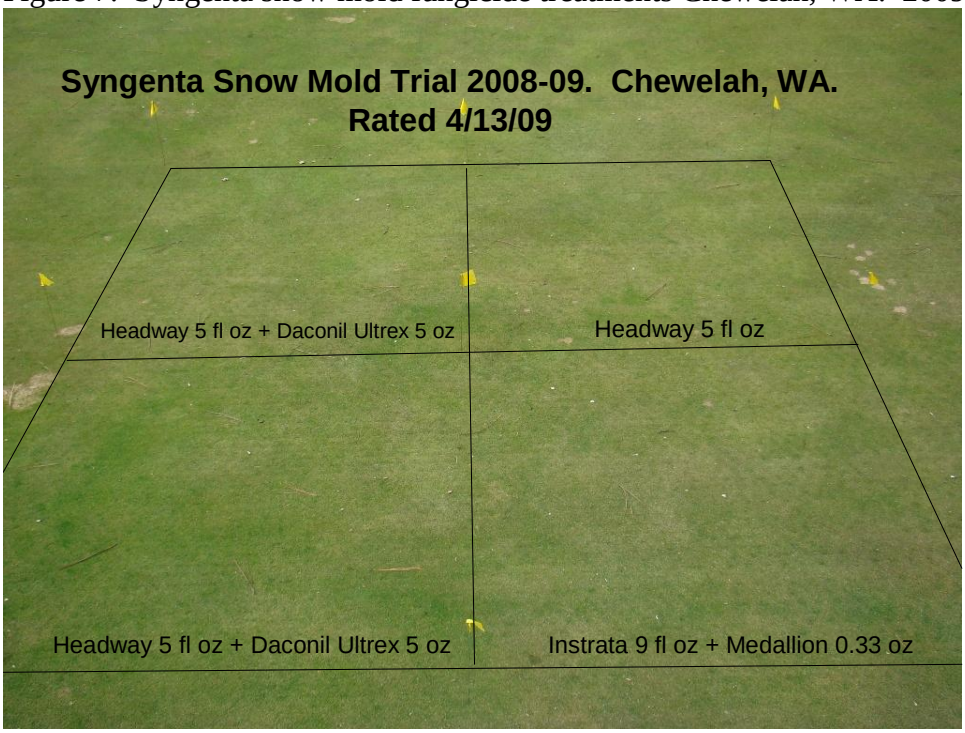

Figure 8. Syngenta snow mold fungicide treatments Chewelah, WA. 2009.

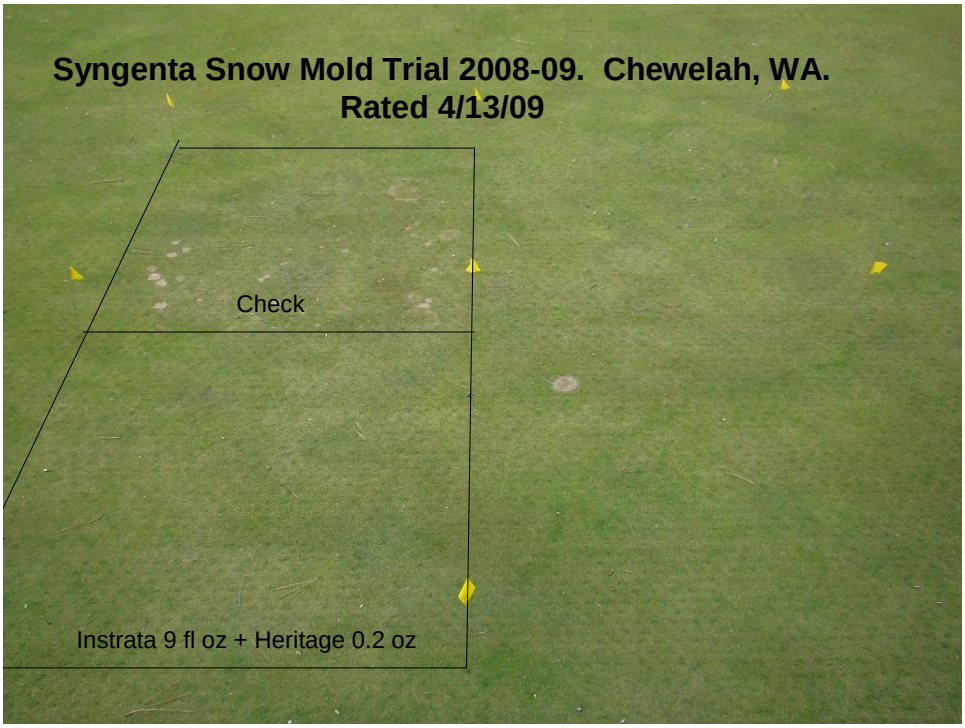

Table 3. The effect of several fungicide combinations to control pink and gray snow mold. McCall, ID. 2009.

Fungicide treatment	Rate (oz or fl oz/M)	Tank mix (prod g or ml/0.5 gal)	Disease (% area infected)	Turfgrass quality**
Instrata (Propiconazole + Fludioxonil + Chlorothalonil)	9 fl oz	72.5 ml	0.0 a*	6.3 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Heritage (Azoxystrobin)	9 fl oz 0.2 oz	72.5 ml 1.5 g	0.0 a	6.3 a
Instrata (Propiconazole + Fludioxonil + Chlorothalonil) + Medallion (Fludioxonil)	9 fl oz 0.33 oz	72.5 ml 2.5 g	0.0 a	6.3 a
Headway (Propiconazole + Azoxystrobin) + Medallion (Fludioxonil)	5 fl oz 0.33 oz	40.3 ml 2.5 g	0.0 a	6.3 a
Headway (Propiconazole + Azoxystrobin) + Daconil Ultrex (Chlorothalonil)	5 fl oz 5 oz	40.3 ml 38.7 g	0.0 a	6.3 a
Headway (Propiconazole + Azoxystrobin)	5 fl oz	40.3 ml	0.0 a	6.0 a
Concert (Propiconazole + Chlorothalonil)	8 fl oz	64.4 ml	0.0 a	6.0 a
Concert (Propiconazole + Chlorothalonil) + Medallion (Fludioxonil)	8 fl oz 0.33 oz	64.4 ml 2.5 g	0.0 a	6.3 a
Concert (Propiconazole + Chlorothalonil) + Heritage (Azoxystrobin)	8 fl oz 0.2 oz	64.4 ml 1.5 g	0.0 a	6.3 a
Check	0	0	30.0 b	2.3 b

*Means within a column followed by the same latter are not significantly different. LSD $P = 0.05$.

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

Figure 9. Syngenta snow mold fungicide treatments McCall, ID. 2009.

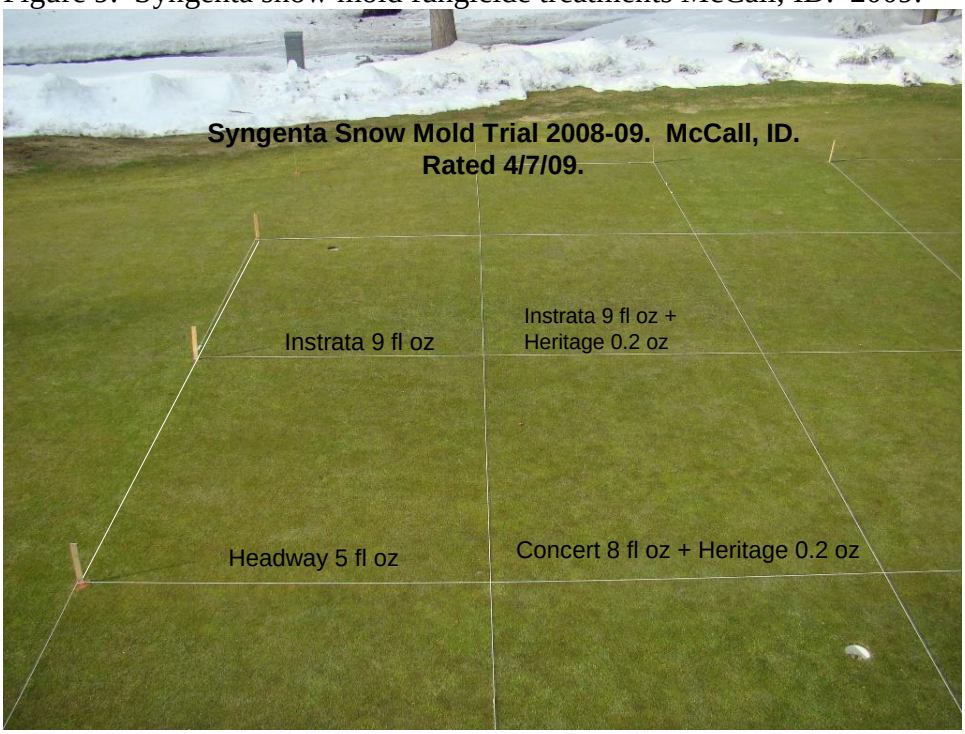

Figure 10. Syngenta snow mold fungicide treatments McCall, ID. 2009.

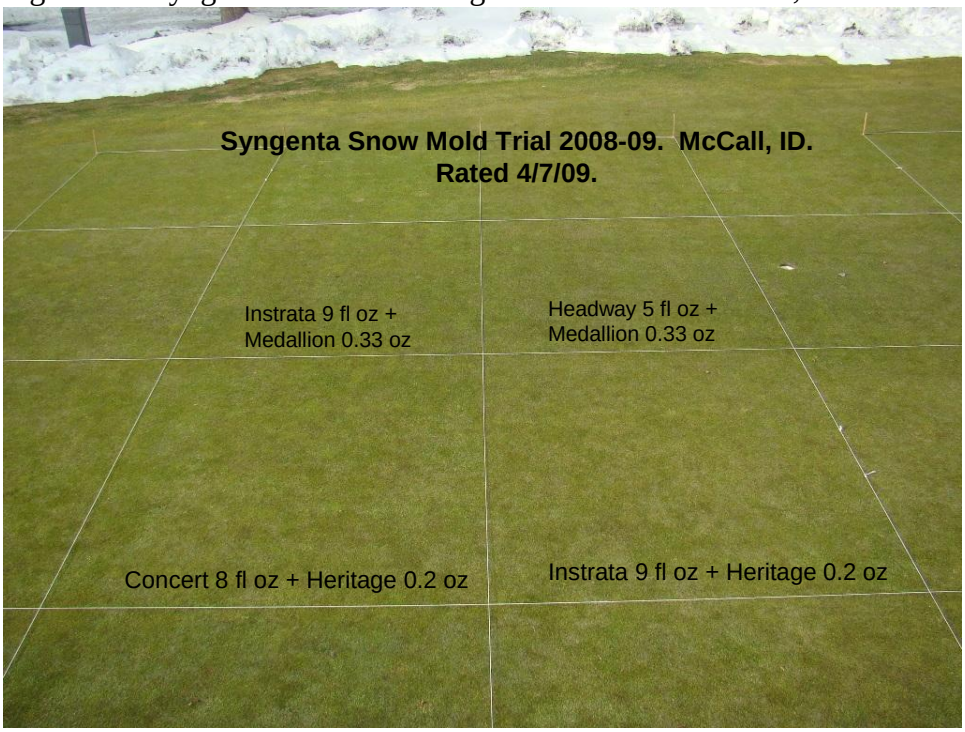

Figure 11. Syngenta snow mold fungicide treatments McCall, ID. 2009.

Figure 12. Syngenta snow mold fungicide treatments McCall, ID. 2009.

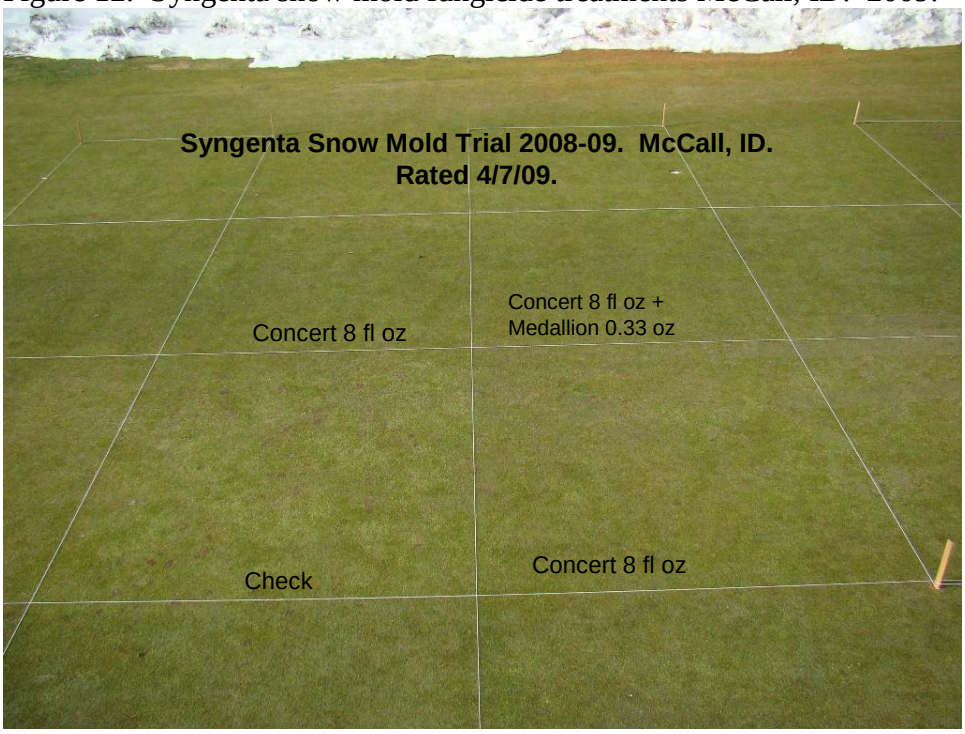

Figure 13. Syngenta snow mold fungicide treatments McCall, ID. 2009.