

Civitas + Harmonizer with or without Low Rates of Fungicides to Control Snow Mold on Putting Greens in Washington 2011-2012

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Snow mold control trials were conducted at 2 locations in the Intermountain Region of the PNW, on a research green at the WSU Turfgrass and Agronomy Research Center (TARC) in Pullman, WA and a nursery green at the Chewelah Golf and Country Club in Chewelah, WA. The research green at Pullman is a pure stand of 'T-1' creeping bentgrass grown on an USGA specification putting green and the nursery green at Chewelah is a push-up green on 3" to 4" of sand with 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 31 Oct 2011 at Chewelah and 3 (early) and/or 15 (late) Nov 2011 at Pullman. Fungicides were applied at 80 GPA with a bicycle-wheeled CO₂ pressurized (40 psi) sprayer with 11008 flat fan TeeJet nozzles. At Pullman, snow cover was intermittent totaling approximately 42 days. Continuous snow cover lasted from the beginning of December 2011 through the first week of April 2012 (approx. 125 days) at Chewelah. Individual plots were evaluated for pink (*Microdochium nivale*) and/or gray (*Typhula spp.*) snow mold disease severity (% area infected). Turfgrass quality was 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 on 27 Mar 2012 at Pullman and 9 Apr 2012 at Chewelah.

At Pullman, the untreated Check had approximately 8% of the area infected with pink snow mold (Table 1). Although not significantly different, treatments that had Torque or Instrata resulted in numerically less snow mold compared to Civitas 29.2 fl oz/M + Harmonizer 7.3 fl oz/M (Late), Civitas 14.6 fl oz/M + Harmonizer 0.91 fl oz/M (Early and Late), or Civitas 14.6 fl oz/M + Harmonizer 3.65 fl oz/M (Early and Late). Civitas 29.2 fl oz/M + Harmonizer 1.82 fl oz/M (Late), Civitas 14.6 fl oz/M + Harmonizer 0.91 fl oz/M (Late) , Civitas 14.6 fl oz/M (Late) , or Harmonizer 0.91 fl oz/M (Late) were no different in snow mold control than the untreated Check.

All treatments with Harmonizer added resulted in a significant increase in turfgrass color compared to the untreated Check when rate on 27 Mar 2012. High rates of Harmonizer either 7.3 fl oz/M applied Late or when applied as a split treatment Early

and Late at 3.65 fl oz/M resulted in the highest color ratings compared to the other treatments. In general, the higher the amount of Harmonizer in a treatment the greater the increase in color.

Turfgrass quality was affected by the amount of Harmonizer added and/or snow mold disease present when rated. As with color, the high rates of Harmonizer resulted in the highest turfgrass quality compared to the other treatments. Torque 0.6 fl oz/M or Instrata 5.5 fl oz/M tank mixed with Civitas 14.6 fl oz/M + Harmonizer 0.91 fl oz/M, which resulted in excellent disease control, had significantly higher turfgrass quality compared to Civitas 14.6 fl oz/M + Harmonizer 0.91 fl oz/M. However, there was no significant difference in turfgrass quality between split applications of Civitas 14.6 fl oz/M + Harmonizer 0.91 fl oz/M with or without Torque 0.6 fl oz/M. Figures 1 to 6 show treatment in reps 1 and 2.

At Chewelah, the untreated check had approximately 50% of the area infected with pink and gray snow mold (Table 2). Civitas 29.2 fl oz/M + Harmonizer either at 1.82 fl oz/M or 7.3 fl oz/M did result in a significant reduction (approximately 20%) in snow mold disease compared to the untreated Check. However, the treatments that resulted in the greatest reduction in snow mold disease were Instrata 5.5 fl oz/M or Instrata 5.5 fl oz/M + Civitas 29.2 fl oz/M + Harmonizer 1.82 fl oz/M. Since snow mold disease was not completely controlled (the treatment with the lowest amount of disease had 11% area infected) the addition of Harmonizer had little effect on turfgrass quality, however, Harmonizer did have a significant impact on turfgrass color. All treatment with Harmonizer resulted in higher turfgrass color. And to some extent did mask the bleached color of the snow mold disease spots on the turf. Figures 7 to 11 show treatments in reps 1 and 2.

Overall, Civitas + Harmonizer applied in split applications at 14.6 fl oz/M + 0.91 or 3.65 fl oz/M or single applications at higher rates did provide some snow mold disease control compared to the untreated check. However, generally, tank mixing a low rate of Instrata or Torque with Civitas + Harmonizer resulted in better control. It is obvious that Harmonizer is very stable and lasts a long time in turfgrass leaf tissue and that increased rates result in higher turfgrass color ratings in the spring.

Table 1. The effect of Civitas + Harmonizer with or without low rates of fungicides on a 'T-1' creeping bentgrass green to control pink snow mold at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

Fungicide treatment	Rate (fl oz/M)	App. timing*	Snow mold		
			(% area infected)	Turfgrass quality**	Color***
Civitas + Harmonizer + Torque	14.6 0.91 0.6	Early	0.0 c****	6.5 ab	6.0 b
Civitas + Harmonizer + Torque	14.6 0.91 0.6	Late			
Civitas + Harmonizer + Torque	14.6 0.91 0.6	Late	0.0 c	6.1 b	5.3 b
Civitas + Harmonizer + Instrata	14.6 0.91 5.5	Late	0.8 c	6.4 ab	5.5 b
Civitas + Harmonizer	29.2 7.3	Late	2.5 bc	7.1 a	7.5 a
Civitas + Harmonizer	14.6 0.91	Early	2.5 bc	6.1 b	6.0 b
Civitas + Harmonizer	14.6 0.91	Late			
Civitas + Harmonizer	14.6 3.65	Early	3.3 bc	7.3 a	7.6 a
Civitas + Harmonizer	14.6 3.65	Late			
Civitas + Harmonizer	29.2 1.82	Late	5.3 ab	4.9 c	5.8 bc
Civitas + Harmonizer	14.6 0.91	Late	5.3 ab	4.7 c	5.1 e
Civitas	14.6	Late	5.3 ab	2.8 d	3.0 g
Harmonizer	0.91	Late	7.3 a	3.1 d	4.6 f
CHECK	0		8.3 a	2.3 d	2.9 g

*App. timing: Early = 11/3/11 and Late = 11/15/11.

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

***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. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

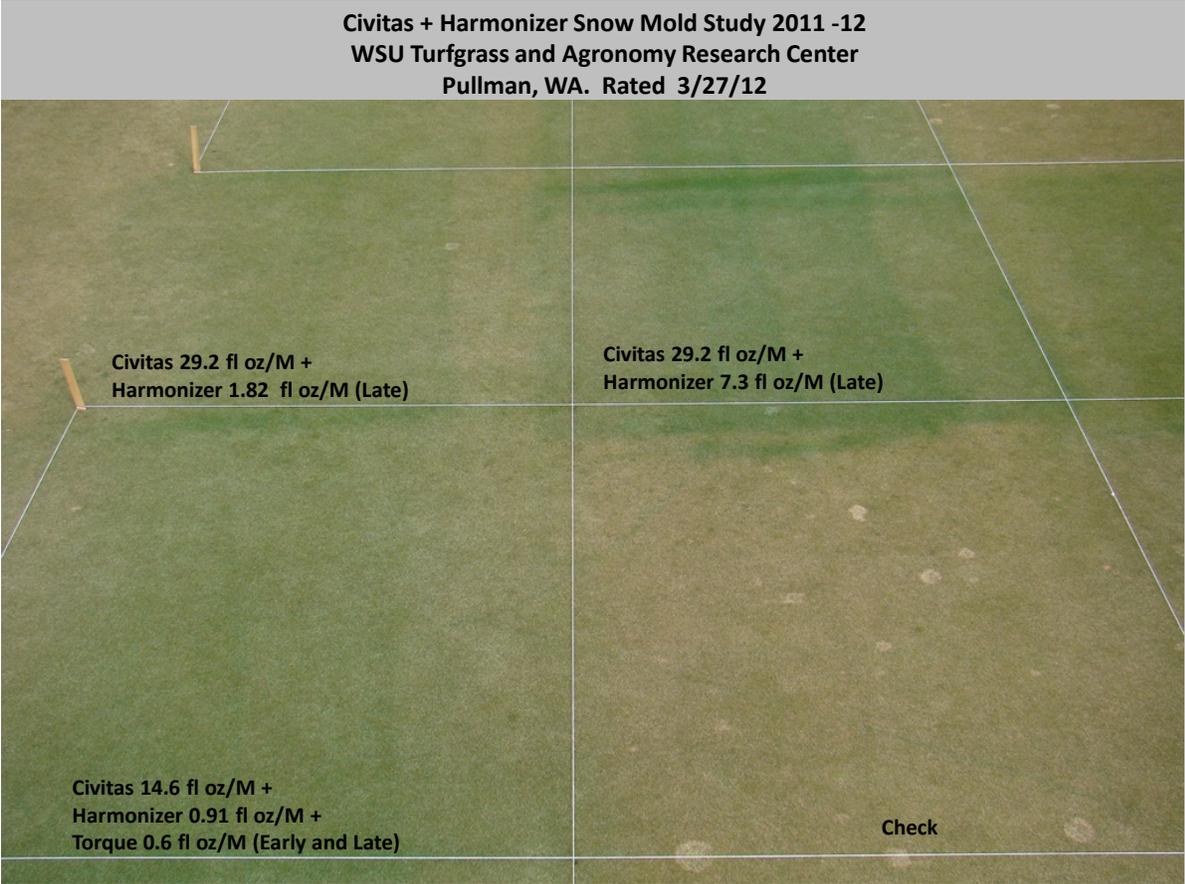


Fig. 2. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

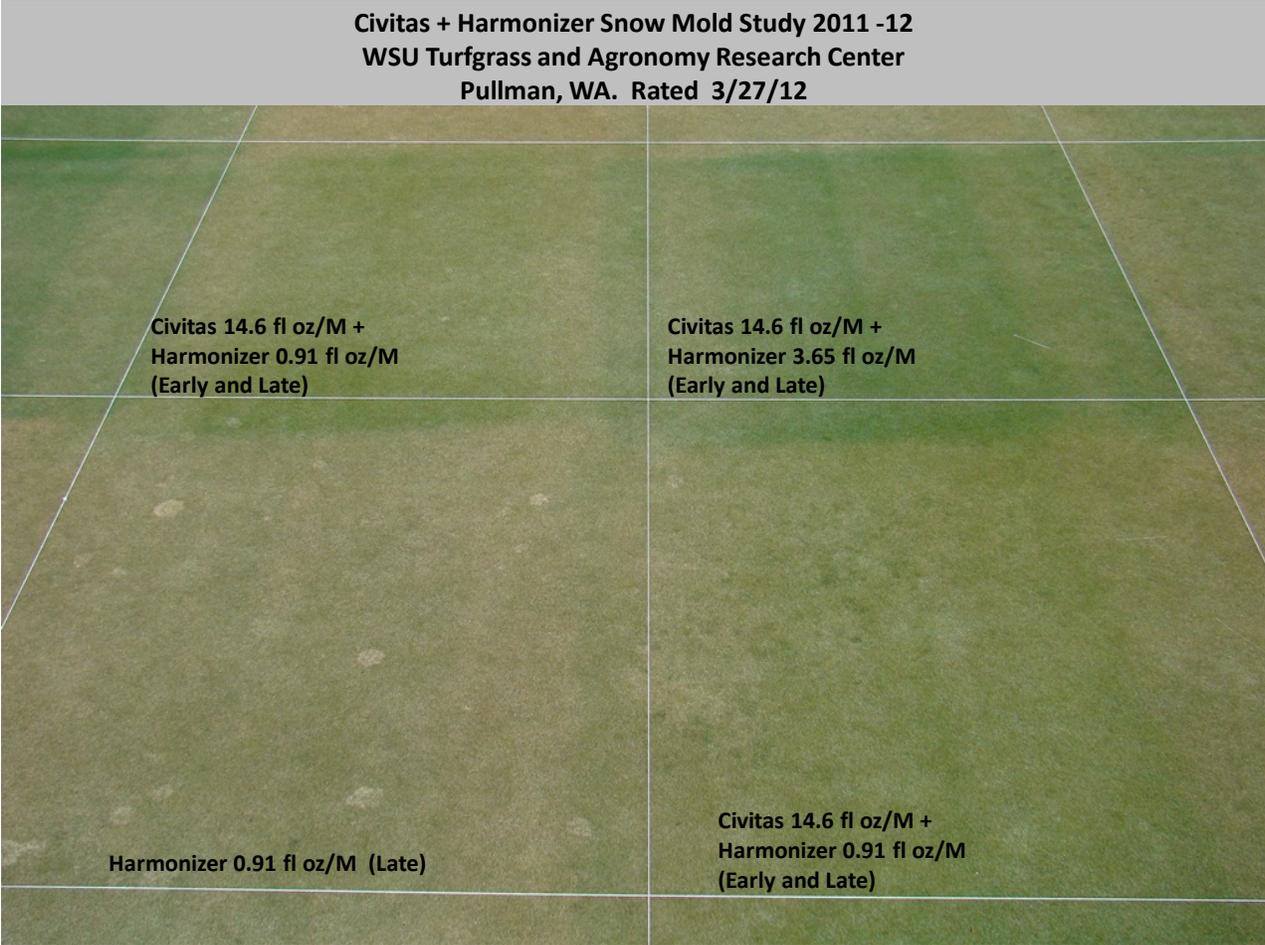


Fig. 3. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

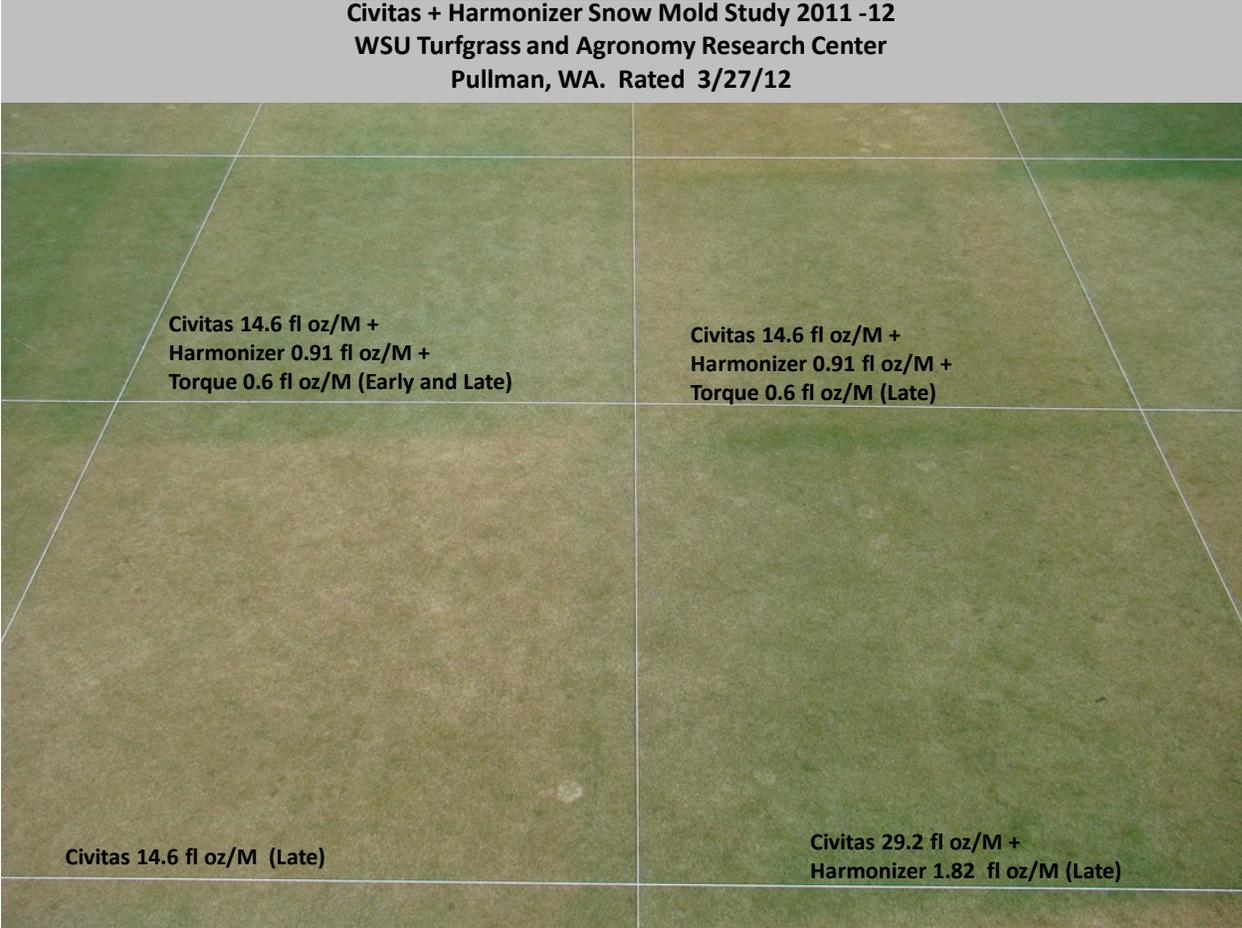


Fig. 4. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

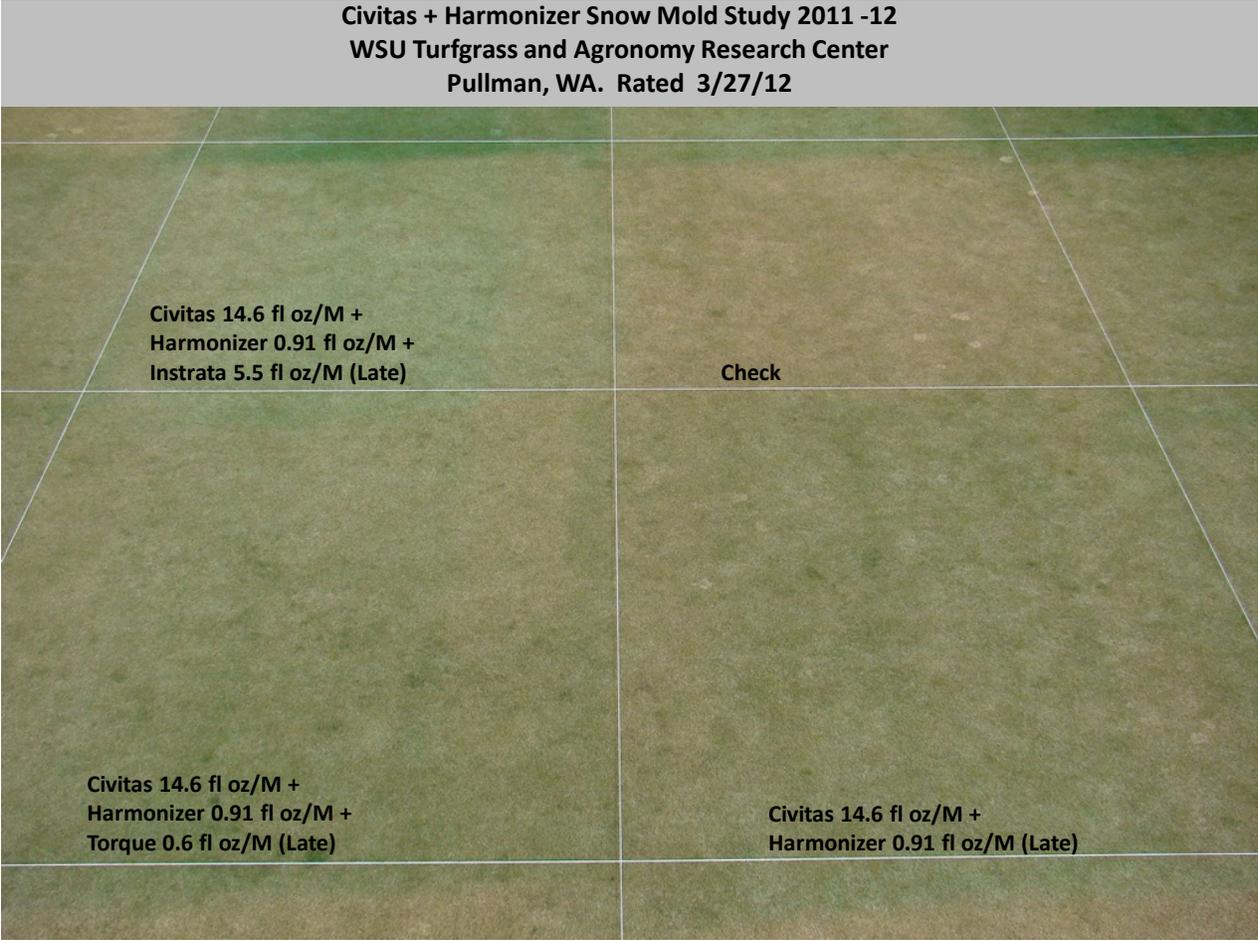


Fig. 5. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

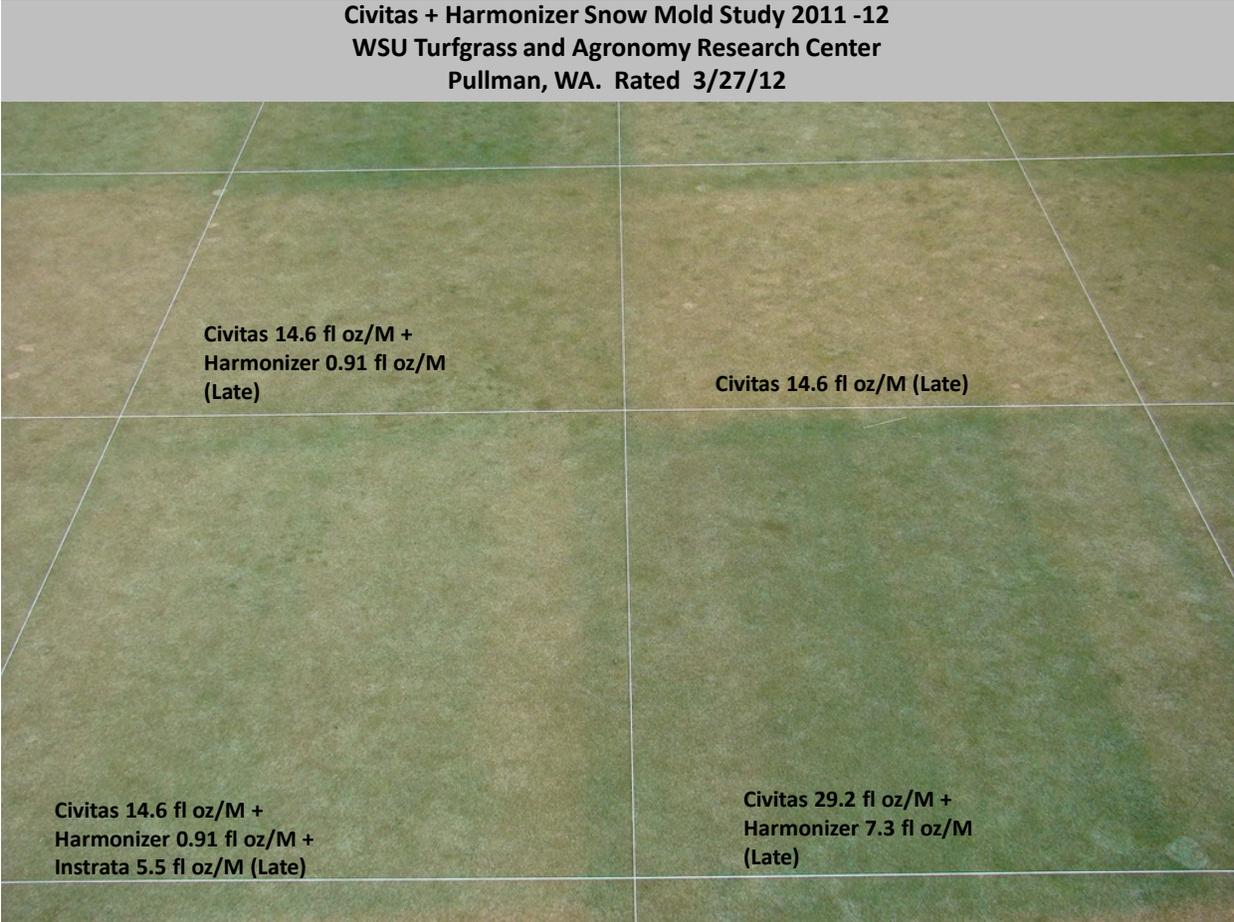


Fig. 6. Civitas + Harmonizer snow mold treatments on a creeping bentgrass green at the WSU Turfgrass and Agronomy Research Center in Pullman, WA. Rated on 27 Mar 2012.

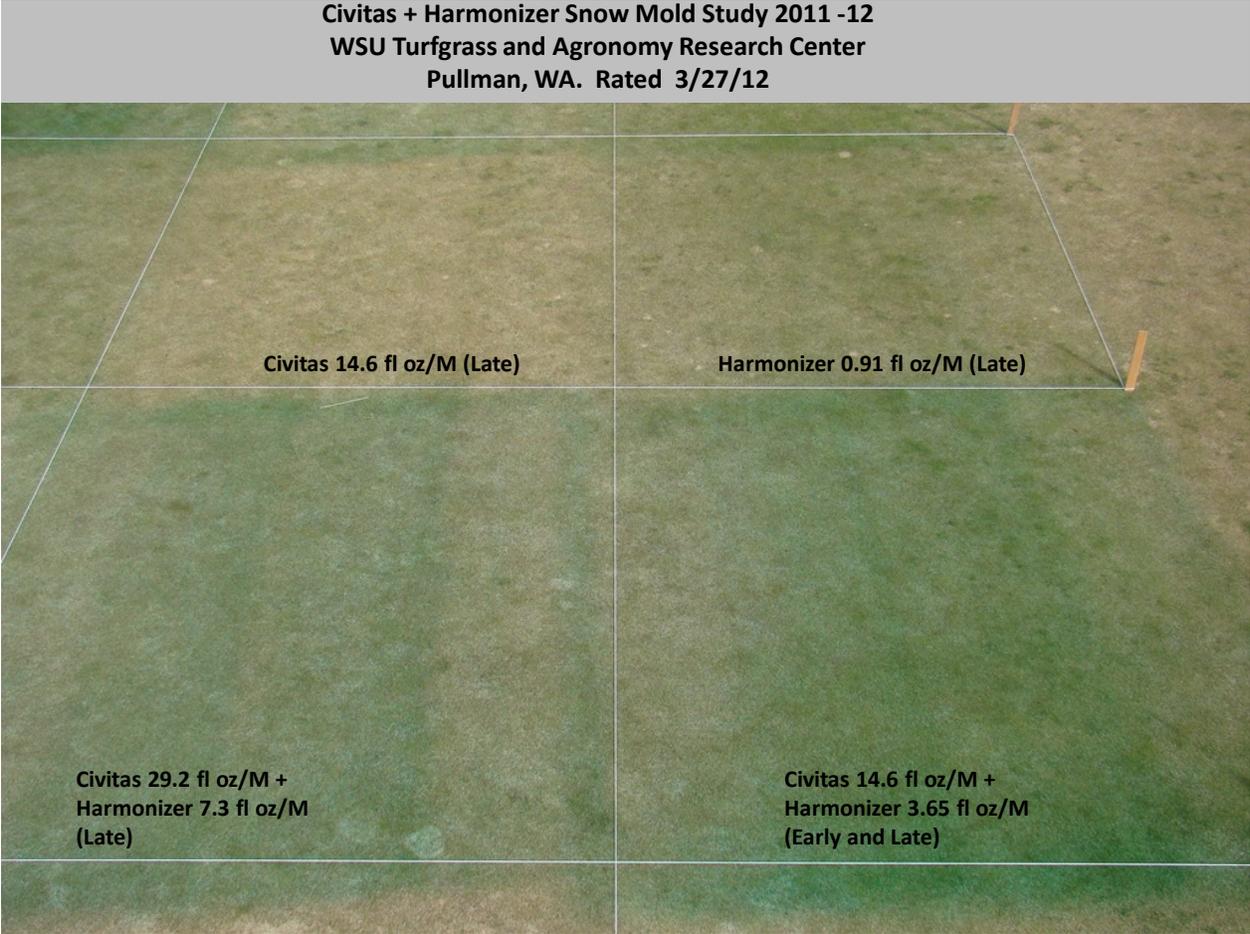


Table 2. The effect of Civitas + Harmonizer with or without low rates of fungicides to control pink and gray snow mold on a 'Penncross' creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

Fungicide treatment	Rate (fl oz/M)	Snow mold		
		(% area infected)	Turfgrass quality*	Color**
Instrata	5.5	10.8 e***	4.1 a	4.8 c
Civitas + Harmonizer + Instrata	29.2 1.82 5.5	14.3 de	4.3 a	7.3 b
Civitas + Harmonizer + Torque	29.2 1.82 0.6	21.0 cd	4.0 a	7.1 b
Civitas + Harmonizer	29.2 1.82	28.0 bc	3.0 b	6.9 b
Torque	0.6	32.5 b	2.4 bc	4.6 cd
Civitas + Harmonizer	29.2 7.3	33.8 b	3.9 a	8.0 a
Check	0	50.0 a	1.8 c	4.3 d

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

**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. 7. Civitas + Harmonizer snow mold treatments on a creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

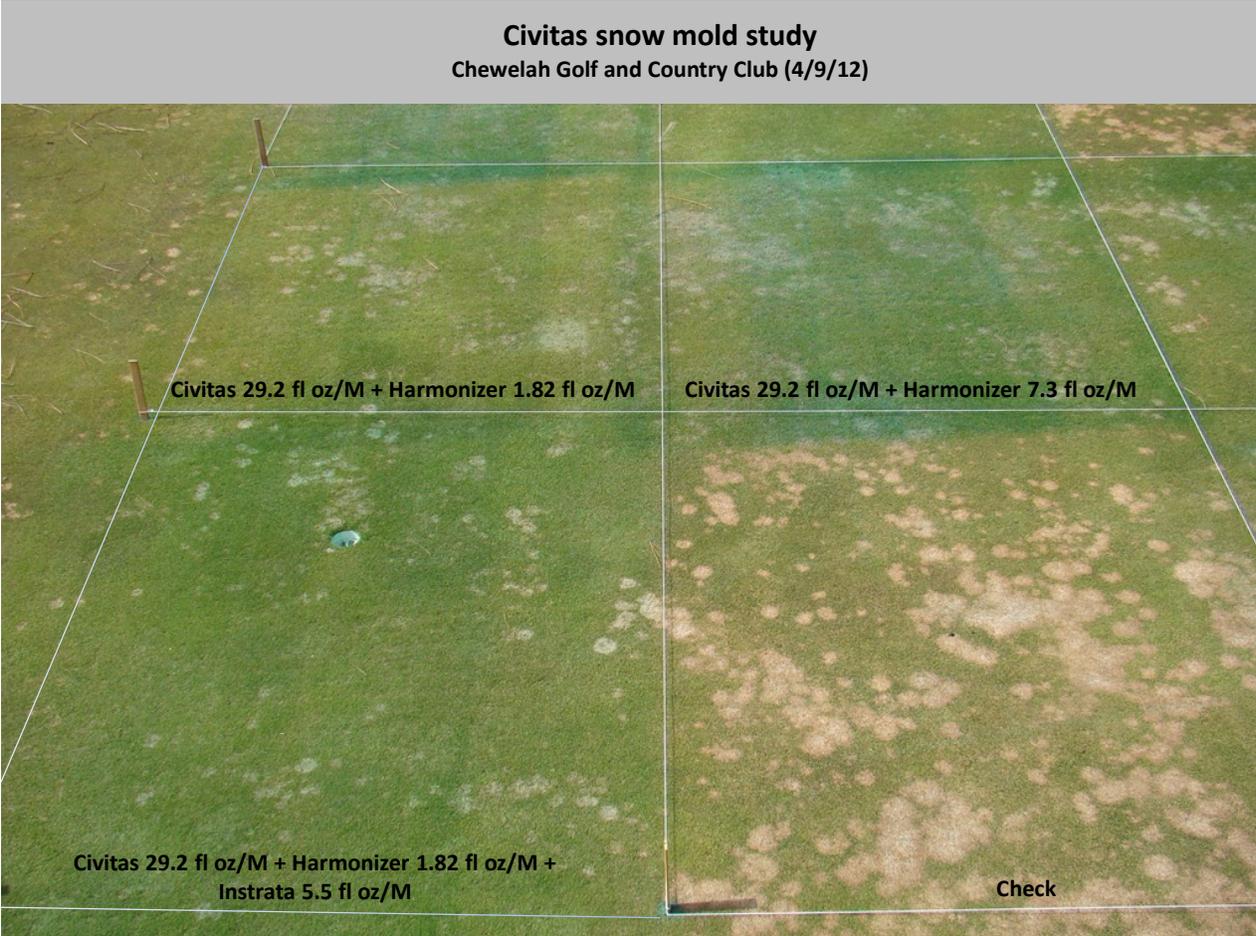


Fig. 8. Civitas + Harmonizer snow mold treatments on a creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

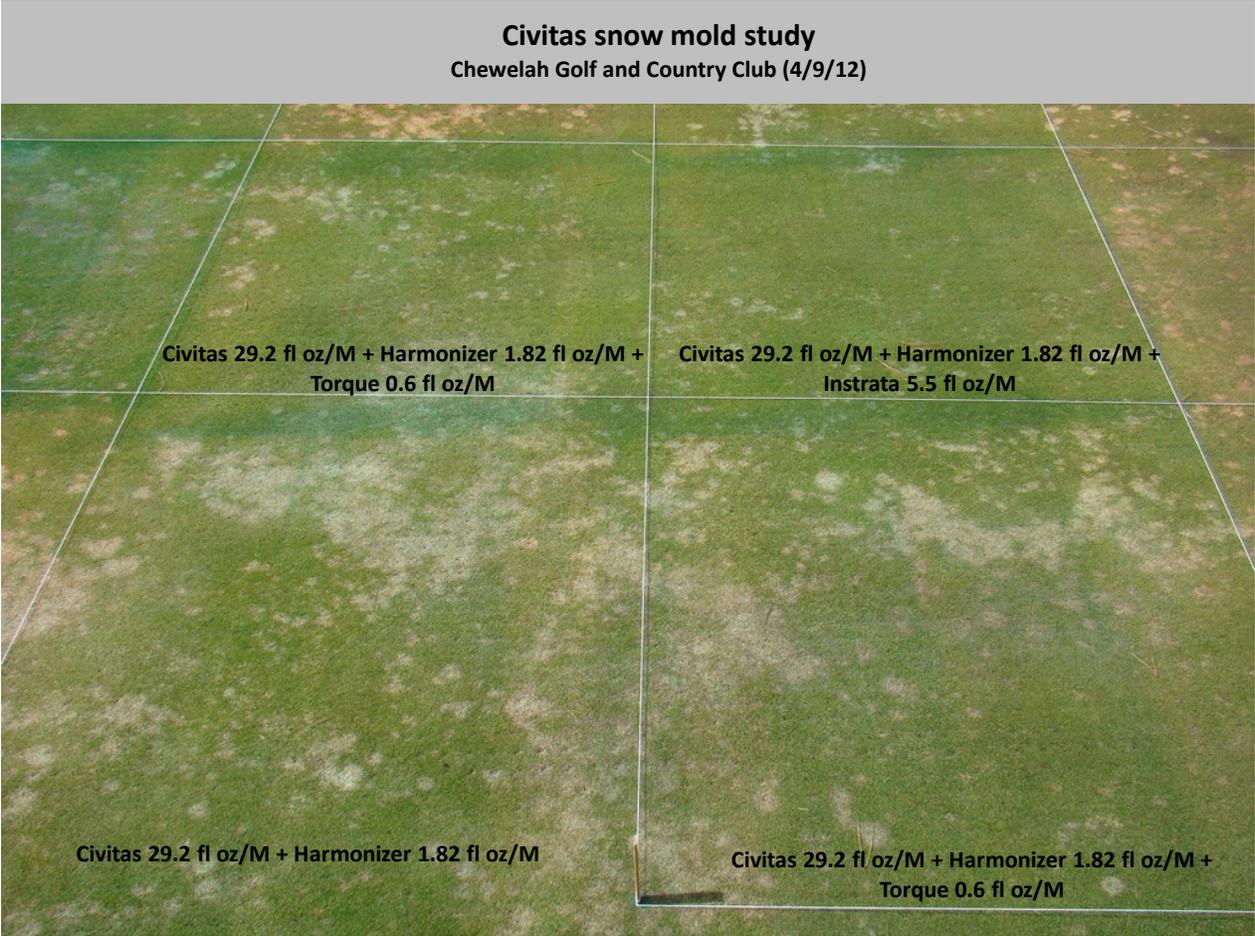


Fig. 9. Civitas + Harmonizer snow mold treatments on a creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

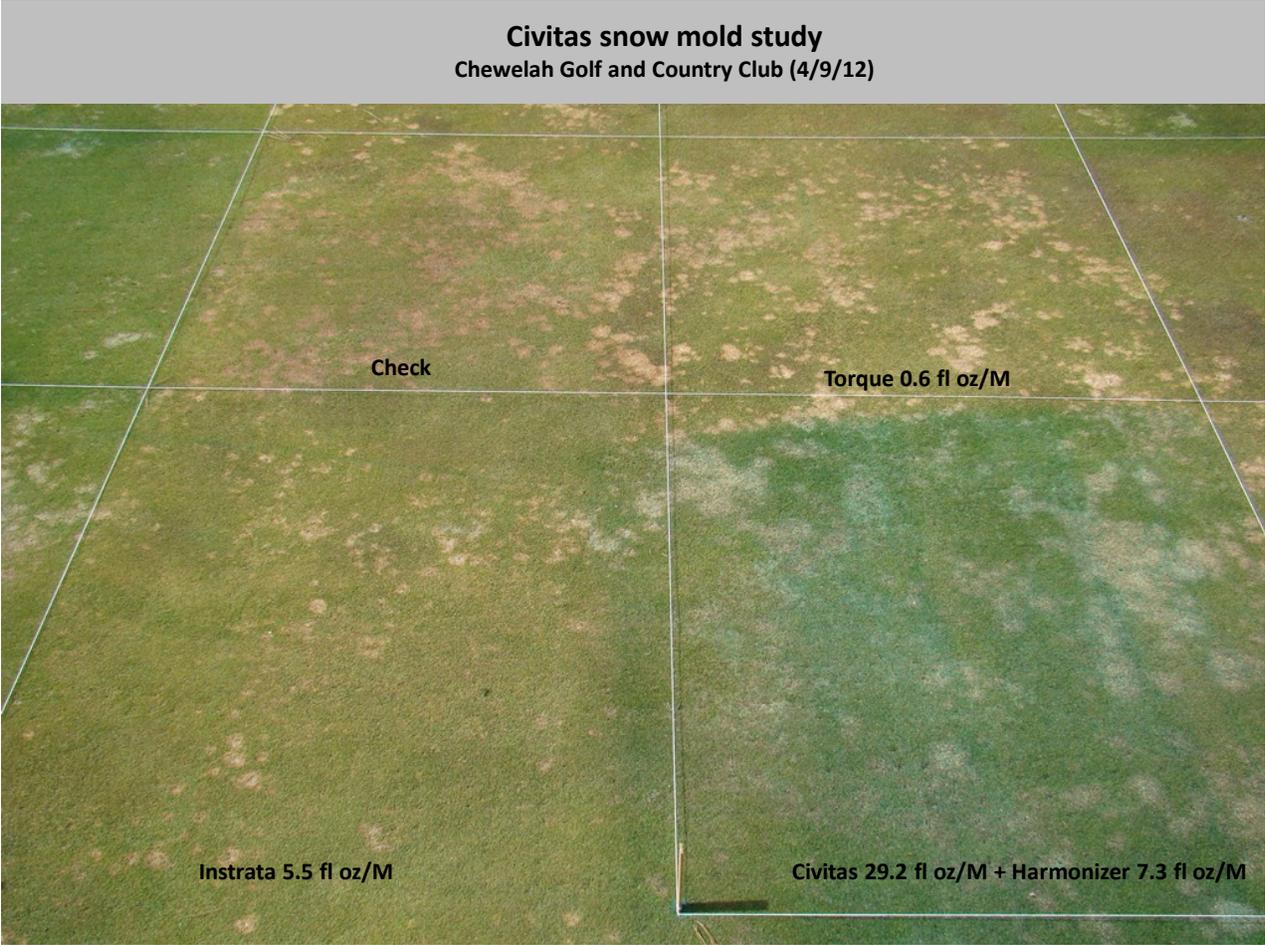


Fig. 10. Civitas + Harmonizer snow mold treatments on a creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

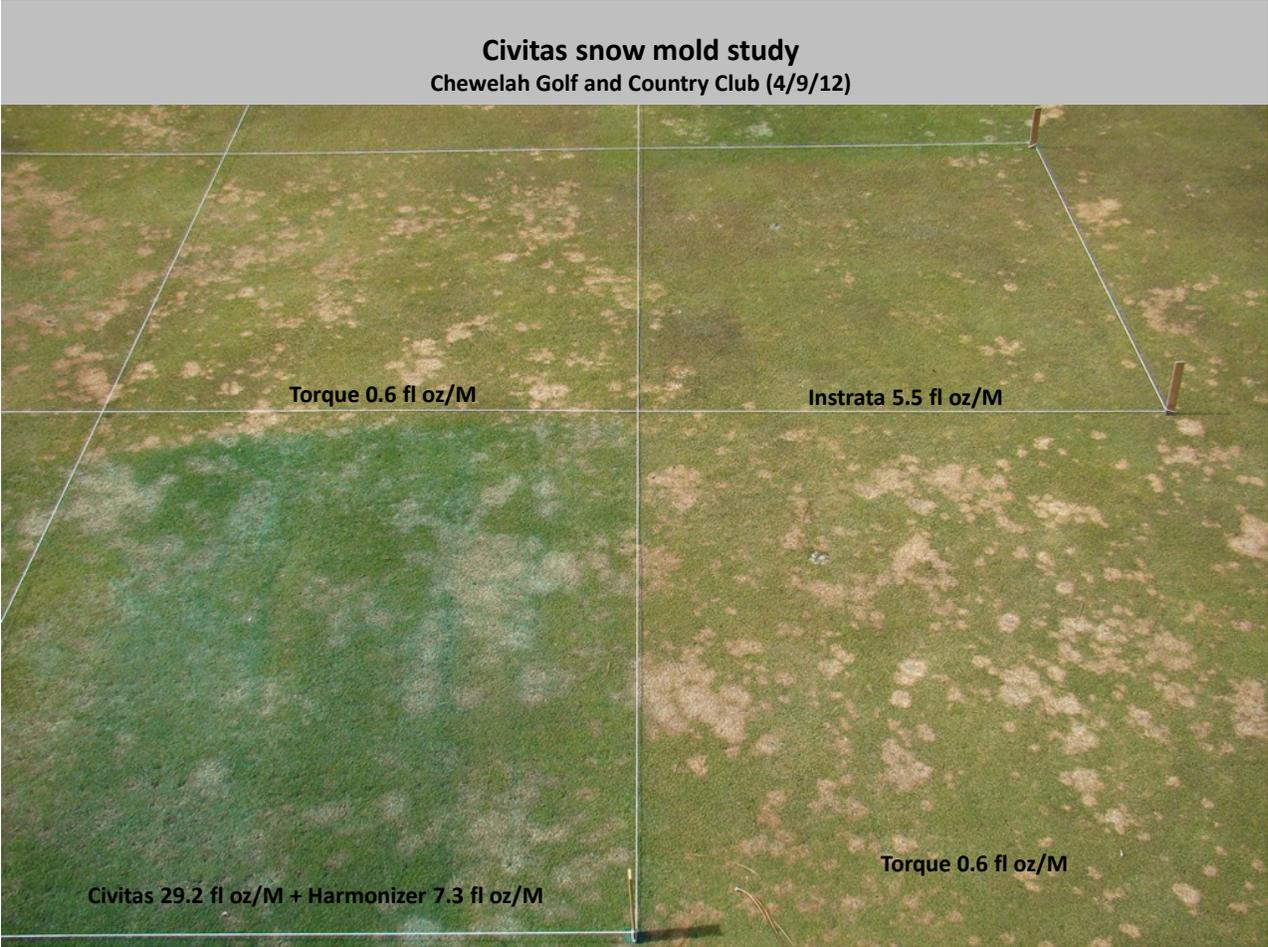


Fig. 11. Civitas + Harmonizer snow mold treatments on a creeping bentgrass/annual bluegrass green at Chewelah Golf and Country Club, Chewelah, WA. Rated on 9 Apr. 2012.

