

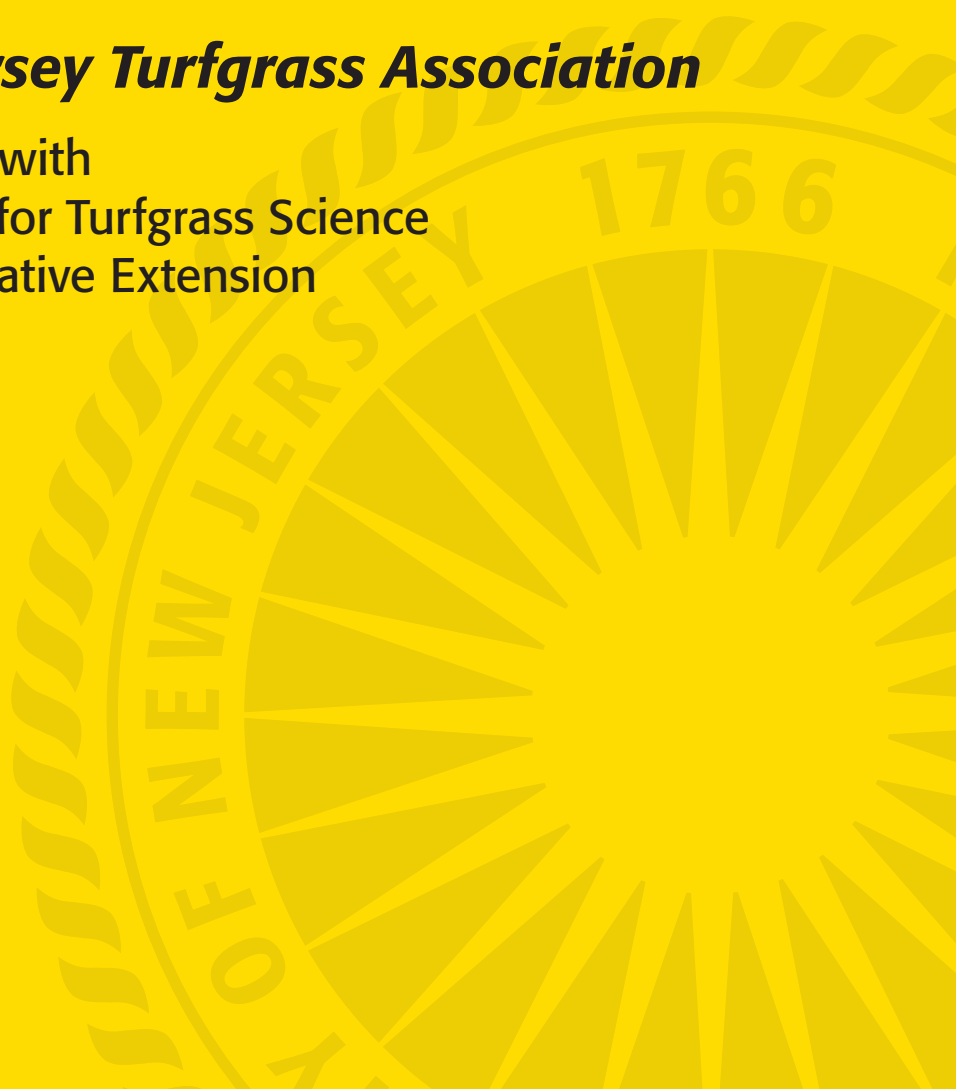
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The Rutgers Turfgrass Proceedings is published yearly by the Rutgers Center for Turfgrass Science, Rutgers Cooperative Extension, and the New Jersey Agricultural Experiment Station, School of Environmental and Biological Sciences, Rutgers, The State University of New Jersey in cooperation with the New Jersey Turfgrass Association. The purpose of this document is to provide a forum for the dissemination of information and the exchange of ideas and knowledge. The proceedings provide turfgrass managers, research scientists, extension specialists, and industry personnel with opportunities to communicate with co-workers. Through this forum, these professionals also reach a more general audience, which includes the public.

This publication includes lecture notes of papers presented at the 2010 GREEN EXPO Turf and Landscape Conference. Publication of these lectures provides a readily available source of information

covering a wide range of topics and includes technical and popular presentations of importance to the turfgrass industry.

This proceedings also includes research papers that contain original research findings and reviews of selected subjects in turfgrass science. These papers are presented primarily to facilitate the timely dissemination of original turfgrass research for use by the turfgrass industry.

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Dr. Ann Brooks Gould, Editor
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IMPACT OF FUNGICIDES AND BIORATIONAL PRODUCTS FOR THE CONTROL OF PINK SNOW MOLD ON PERENNIAL RYEGRASS, 2008-2009

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Fungicides were evaluated for their ability to control pink snow mold (caused by *Microdochium nivale*) on a perennial ryegrass (*Lolium perenne*) tee and creeping bentgrass (*Agrostis stolonifera* cv Pennncross) green at the Peace Pipe Country Club in Denville, NJ. Turf was established on a sandy loam with a pH of 6.7 in 1995 (tee #7) and 2008 (green #4), respectively. The tee was cut five times per week at 0.375 inches and the green was mowed daily at 0.156 inches with clippings collected. Fertilizer was applied as 46-0-0 (0.50 lb nitrogen (N)/1000 ft²) on 29 August 2008 and as 18-3-17 (0.75 lb N/1000 ft²) on 25 September 2008. Plots were 3 x 9 ft and were arranged in a randomized complete block with four replications. Turf was irrigated to avoid drought stress.

Fungicides were applied in water equivalent to 1.9 gal per 1000 ft² with a CO₂ powered sprayer at 30 psi using TeeJet 8003VS flat fan nozzles. Treatments (trt) were first applied on 21 November 2008 when environmental conditions were conducive to pink snow mold development and were repeated on 13 February where indicated in Tables 1A and 1B. Turf was visually evaluated for number of pink snow mold infested patches per plot on 21 November 2008, 13 February 2009, and 10 March 2009. Average patch diameter was 1.75 inches. Turf quality was assessed on 10 March 2009 using a 1 to 9 scale, where 9 = best turf quality and 5 = acceptable quality. Phytotoxicity was assessed on the same day using a 1 to 5 scale, where 1 = no foliar discoloration, 2 = slight chlorosis

or necrosis, 3 = moderate chlorosis or necrosis, 4 = severe chlorosis or necrosis, and 5 = all turf dead. Data were subjected to analysis of variance and means were separated using the Waller-Duncan *k*-ratio *t*-test (*k* = 100).

Pink snow mold was first observed on 21 November 2008 and became uniform throughout the two study areas by 13 February 2009 (Tables 1A and 1B). Disease incidence ranged from 3 to 20 patches (tee #7, Table 1A) and 6 to 19 patches (green #4, Table 1B) per plot on untreated turf (trts 20 and 12, respectively), which was considered a low to moderate level of snow mold infestation. Less than 5 infested patches per plot represented an acceptable level of disease control. All treatments in the two studies provided excellent control of pink snow mold during the evaluation period (21 November 2008 to 10 March 2009), except for Rhapsody QRD 145 AS (trt 18, Table 1A) and Banner MAXX 1.3 ME (trt 6, Table 1B).

Turf quality was acceptable (greater or equal to 5.0) for all entries in the two studies (Tables 1A and 1B) on 10 March 2009, except for Disarm-C 0.25SC + Banner MAXX 1.3ME (trt 8, Table 1A). This reduction in turf quality was due to the moderate degree of foliar tip burn (winter injury) associated with this treatment on 10 March 2009. Overall, turf quality was closely but inversely associated with pink snow mold severity.

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Table 1A. Impact of fungicides and biorational products for control of pink snow mold at the Peace Pipe GC, Denville, NJ (2008/2009); perennial ryegrass tee #7 maintained at 0.375-inch height of cut.

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Number of Lesion Centers per Plot ¹			Turf Quality ²	Phytotoxicity ³
			21 Nov.	13 Feb.	10 March		
1 Insignia 20WG	0.9 oz	1,2	0.0 a	2.5 bc	1.5 d	5.8 a	1.0 b
2 Insignia 20WG	0.5 oz						
+ Trinity 1.67SC	1.0 fl oz	1,2	0.0 a	3.8 bc	2.8 cd	5.8 a	1.0 b
3 Trinity 1.67SC	1.0 fl oz	1,2	0.0 a	2.8 bc	4.8 cd	5.5 a	1.0 b
4 Disarm 480SC	0.36 fl oz	1,2	0.0 a	1.3 bc	2.5 cd	5.5 a	1.0 b
5 Disarm 0.25G	72.0 oz	1,2	0.0 a	0.5 c	2.3 cd	5.3 ab	1.0 b
6 Disarm-C SC	6.0 fl oz	1,2	0.0 a	0.5 c	4.8 cd	5.5 a	1.5 b
7 ARY 0534-002 2.65SC	0.6 fl oz	1,2	0.0 a	4.0 bc	4.8 cd	5.0 ab	1.3 b
8 Disarm-C 0.25SC	3.0 fl oz						
+ Banner MAXX 1.3ME	3.0 fl oz	1,2	0.0 a	4.3 bc	2.3 cd	4.0 b	3.0 a
9 Disarm-C 0.25SC	3.0 fl oz						
+ Chipco 26GT 2SC	4.0 fl oz	1,2	0.0 a	3.3 bc	4.5 cd	5.3 ab	1.3 b
10 Disarm-C 0.25SC	3.0 fl oz						
+ Veranda 11.3WDG	0.88 oz	1,2	0.0 a	1.8 bc	2.3 cd	5.5 a	1.5 b
11 BAS 673UB F 0.81G	36.0 oz	1	0.0 a	2.3 bc	4.8 cd	5.3 ab	1.0 b
12 BAS 673UB F 0.81G	48.0 oz	1	0.0 a	1.8 bc	4.0 cd	5.5 a	1.0 b
13 Insignia 20WG	0.9 oz	1	1.0 a	5.0 b	3.3 cd	5.8 a	1.3 b
14 Insignia 20WG	0.9 oz						
+ Trinity 1.67SC	1.0 fl oz	1	0.0 a	0.5 c	3.3 cd	5.3 ab	1.0 b
15 Rhapsody QRD 145 AS	5.0 fl oz	1,2	0.5 a	1.8 bc	4.0 cd	5.5 a	1.0 b
+ Insignia 20WG	0.5 oz						
16 Rhapsody QRD 145 AS	5.0 fl oz	1,2	0.0 a	1.5 bc	2.3 cd	5.5 a	1.3 b
+ Turfcide 400F 4F	6.0 fl oz	1,2	0.0 a	4.3 bc	5.0 c	5.3 ab	1.0 b
17 Turfcide 400F 4F	12.0 fl oz	1	0.0 a	1.3 bc	9.3 b	5.5 a	1.0 b
18 Rhapsody QRD 145 AS	5.0 fl oz	1,2	0.8 a	2.5 bc	2.0 cd	5.8 a	1.0 b
19 Heritage 50W	0.4 oz	1,2	3.0 a	18.0 a	20.0 a	4.8 ab	1.0 b
20 Untreated check	—	—	—	—	—	—	—

(Continued)

Table 1A (continued).

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Number of Lesion Centers per Plot ¹			Turf Quality ²		Phytotoxicity ³	
			21 Nov.	13 Feb.	10 March	10 March	10 March	10 March	10 March
		INT ⁵	DAT ⁶	DAT	DAT	DAT	DAT	DAT	
		1	— ⁷	84	110	110	110	110	
		2	—	—	25	25	25	25	

¹ Values are means of four replicates. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test (*k* = 100).

² Turf quality on a scale of 1 to 9, where 9 = best turf quality and 5 = commercially acceptable quality.

³ Phytotoxicity on a 1 to 5 scale, where 1 = no discoloration, 2 = slight foliar chlorosis or necrosis, 3 = moderate chlorosis or necrosis, 4 = severe chlorosis or necrosis, and 5 = all turf dead.

⁴ Fungicides were applied on 1 = 21 November 2008 and/or 2 = 13 February 2009 as indicated in the application interval column.

⁵ Spray interval in days.

⁶ Days after the last treatment.

⁷ Pre-treatment disease evaluation on 21 November 2008.

Table 1B. Impact of fungicides and biorational products for control of pink snow mold at the Peace Pipe GC, Denville, NJ (2008/2009); Penncross creeping bentgrass green (temporary #4) maintained at 0.156-inch height of cut.

Treatment	Rate per 1000 sq ft	Application Schedule (days) ⁴	Number of Lesion Centers per Plot ¹			Turf Quality ²	Phytotoxicity ³
			21 Nov.	13 Feb.	10 March		
1 Medallion 50W	0.5 oz	1,2	3.0 a	4.8 b-d	1.3 bc	6.3 a	1.0 a
2 Endorse 2.5W	4.0 oz	1,2	5.5 a	2.3 b-d	1.8 bc	5.8 ab	1.0 a
3 26/36 39.3F	4.0 fl oz						
+ Endorse 2.5W	4.0 oz	1,2	4.0 a	5.5 b-d	0.0 c	5.5 a-c	1.0 a
4 26/36 39.3F	4.0 fl oz						
+ CX-30 14.3F	2.0 fl oz	1,2	2.3 a	1.0 cd	1.3 bc	5.5 a-c	1.3 a
5 Endorse 2.5W	4.0 oz						
+ CX-30 14.3F	2.0 fl oz	1,2	1.3 a	4.5 b-d	1.8 bc	5.3 bc	1.0 a
6 Banner MAXX 1.3MC	3.0 fl oz	1,2	2.0 a	6.3 b	3.0 b	5.0 bc	1.0 a
7 Instrata XL 3.6SE	6.0 fl oz	1,2	4.8 a	4.3 b-d	0.8 bc	5.0 bc	1.0 a
8 Chipco 26GT 2SC	4.0 fl oz						
+ Daconil Weather Stik 6F	3.6 fl oz	1,2	1.8 a	3.8 b-d	1.0 bc	5.8 ab	1.8 a
9 Tourney 50WDG	0.44 oz	1,2	1.8 a	5.0 b-d	1.8 bc	5.3 bc	1.0 a
10 Tourney 50WDG	0.44 oz						
+ Chipco 26GT 2SC	4.0 fl oz	1,2	2.3 a	3.8 b-d	0.0 c	5.0 bc	1.0 a
11 Curalan EG 50WG	1.0 oz	1,2	0.0 a	0.0 d	0.5 c	5.0 bc	1.0 a
12 Untreated check	—	—	6.0 a	17.5 a	19.3 a	4.3 c	1.0 a
		INT ⁵	DAT ⁶	DAT	DAT	DAT	DAT
		1	— ⁷	84	110	110	110
		2	—	—	25	25	25

¹ Values are means of four replicates. Means followed by the same letter are not significantly different according to Waller-Duncan *k*-ratio *t*-test (*k* = 100). Green seeded at 1 lb per 1000 sq. ft. on 24 August 2008.

² Turf quality on a scale of 1 to 9, where 9 = best turf quality and 5 = commercially acceptable quality.

³ Phytotoxicity on a 1 to 5 scale, where 1 = no discoloration, 2 = slight foliar chlorosis or necrosis, 3 = moderate chlorosis or necrosis, 4 = severe chlorosis or necrosis, and 5 = all turf dead.

(Continued)

Table 1B (continued).

⁴ Fungicides were applied on 1 = 21 November 2008 and/or 2 = 13 February 2009 as indicated in the application interval column.

⁵ Spray interval in days.

⁶ Days after the last treatment.

⁷ Pre-treatment disease evaluation on 21 November 2008.