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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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CURATIVE CONTROL OF PYTHIUM BLIGHT ON PERENNIAL RYEGRASS, 2009

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Fungicides were evaluated in 2009 for their ability to control Pythium blight (caused by *Pythium aphanidermatum*) at the Rutgers Turf Research Farm in North Brunswick, NJ on perennial ryegrass (*Lolium perenne* cv. Flash II). Turf was established 2 June 2009 with 14 lb seed/1000 ft^2 on a Norton Loam with a pH of 5.9. The pre-emergence herbicide Tupersan 4.7G (2.5 lb/1000 ft^2) was applied at seeding and on 17 June to suppress weed ingress. Mowing was performed weekly at a height of 3.0 inches with clippings returned. The site was irrigated as needed to prevent drought stress and to encourage disease.

Fertilizer was applied as 16-4-8 at establishment on 2 June (1.0 lb nitrogen (N)/1000 ft^2), on 16 and 26 June (0.65 lb N/1000 ft^2), and on 11 July (0.75 lb N/1000 ft^2). Crabgrass was controlled with Acclaim Extra 0.57SC (20 oz/A) on 11 July. Yellow nutsedge was eliminated with Manage 75WG (1.0 oz/A) and broadleaf weeds were controlled with Trimec Bentgrass 1.3L (1.0 fl oz/1000 ft^2) on 16 July. ProStar 70W (3.0 oz/1000 ft^2) was applied to the entire test area on 17 June, 2 and 16 July, and 6 August to suppress brown patch (caused by *Rhizoctonia solani*). Plots were 3 x 5 ft and were arranged in a randomized complete block with four replications.

Fungicides were applied in water equivalent to 4.0 gal/1000 ft^2 with a $C0_2$ powered sprayer at 30 psi using Tee jet 8003VS flat fan nozzles. Treatments (trt) were initiated on 19 June when environmental conditions were conducive to Pythium blight, except trt 5 which was first applied on 22 June. Fungicides were reapplied as indicated in Table 1. Turf was visually evaluated for percent turf area infested with *P. aphanidermatum* on 18 and 24 June, 14 July, and 11 August. Turf quality was rated on 11 August using a 1 to 9 scale, where 9 = best turf quality and 5 = acceptable quality. Data were subjected to analysis of variance and means were separated using the Waller-Duncan *k*–ratio *t*–test (*k* = 100).

Pythium blight was first observed on 17 June, two days before the study was initiated. Disease became uniform throughout the field by 24 June (Table 1). Disease severity ranged from 7 to 40% turf area infested on untreated turf, which was considered a low to moderate level of *Pythium* infestation. Less than 10% turf area infested per plot represented an acceptable level of disease control. All fungicide entries in this study provided excellent control of Pythium blight through 24 June when disease severity was still relatively low (10% turf area infested on untreated turf), except for HM9333 27LC (trt 33) and Endorse 2.5W (trt 35). When the disease intensified on 14 July (40% turf area infested on untreated turf), Autograph 70W (trt 1), Verio 1.0EC (trt 2), and Banol 6SC (trt 12) provided excellent control of Pythium blight. However, Signature 80WG (trt 3), Subdue MAXX 2MC (trt 4), Segway 3.33SC alone (trts 16 to 19) and in combination with Alude 46L (trt 20), Disarm M 3.82SC (trt 28), Heritage TL 0.8ME alone (trt 31) and in combination with HM9333 27LC (trt 32), and IKF-205 28W (trt 34) were the only products that provided excellent season-long (19 June to 11 August) suppression of this disease.

Turfgrass quality was closely and inversely associated with damage caused by *P. aphanidermatum*. All products that provided excellent control of Pythium blight throughout the trial exhibited acceptable (> 5.0) turfgrass quality on 11 August. No phytotoxicity was observed in this study.

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Table 1. Curative control of Pythium blight on perennial ryegrass: Rutgers University, 2009.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Turf Area Infected (%) per Plot[1]				Turf Quality[2]
				18 June[4]	24 June	14 July	11 Aug.	11 Aug.
1	Autograph 70W	4.57 oz	14	6.5 a	3.5 d	9.8 j-p	15.3 a-g	5.5 d-g
2	Verio 1.0EC	2.0 fl oz	14	6.8 a	2.0 d	0.5 p	8.5 d-h	7.3 ab
3	Signature 80WG	4.0 oz	14	6.5 a	4.8 b-d	11.3 i-p	2.5 f-h	5.5 d-g
4	Subdue MAXX 2MC	1.0 fl oz	14	6.3 a	0.0 d	4.3 n-p	2.8 f-h	6.5 b-d
5	Stellar 5.72SC	1.2 fl oz	14[5]	6.5 a	2.3 d	22.0 e-i	25.3 a-c	5.0 f-i
6	Stellar 5.72SC	1.2 fl oz	14	6.8 a	3.5 d	19.3 f-k	27.5 ab	3.8 jk
7	RU 22112-09D F	0.32 fl oz	14	6.5 a	3.3 d	11.5 i-o	10.0 d-h	5.5 d-g
8	RU 22112-09E SL	0.2 fl oz	14	7.0 a	6.3 a-d	37.0 a-c	18.5 a-d	3.0 k
9	RU 22112-09E SL	0.3 fl oz	14	7.0 a	5.0 b-d	30.5 b-e	16.5 a-f	3.8 jk
10	RU 22112-09D F + RU 22112-09E SL	0.32 fl oz + 0.2 fl oz	14	6.8 a	4.5 b-d	16.0 g-m	13.3 c-h	5.3 e-h
11	RU 22112-09D F + RU 22112-09E SL	0.32 fl oz + 0.3 fl oz	14	6.8 a	2.3 d	19.8 e-k	11.8 c-h	4.5 g-j
12	Banol 6SC	3.0 fl oz	14	6.8 a	6.0 a-d	3.8 n-p	28.3 a	4.3 h-j
13	SARS-409 10%SC	0.75 fl oz	14	6.8 a	6.0 a-d	33.5 b-d	17.5 a-e	4.0 i-k
14	SARS-409 10%SC	1.5 fl oz	14	6.5 a	1.3 d	20.5 e-j	13.5 b-h	4.0 i-k
15	SARS-409 10%SC	3.0 fl oz	14	6.8 a	1.5 d	19.3 f-k	9.8 d-h	4.0 i-k
16	Segway 3.33SC	0.45 fl oz	14	6.8 a	5.0 b-d	5.0 n-p	3.5 e-h	6.3 b-e
17	Segway 3.33SC	0.60 fl oz	14	7.0 a	5.0 b-d	2.0 op	2.8 f-h	7.0 ab
18	Segway 3.33SC	0.75 fl oz	14	7.0 a	3.0 d	2.3 op	1.3 gh	7.3 ab
19	Segway 3.33SC	0.90 fl oz	14	7.0 a	2.8 d	6.0 m-p	2.0 gh	6.3 b-e
20	Segway 3.33SC + Alude 46L	0.45 fl oz + 5.0 fl oz	14	6.0 a	1.5 d	1.8 op	1.5 gh	7.0 ab
21	QRD 709 W	2.0 oz	14	6.5 a	5.0 b-d	46.3 a	12.0 c-h	3.8 jk
22	QRD 709 W	4.0 oz	14	6.8 a	2.0 d	20.8 e-i	9.8 d-h	3.8 jk
23	QRD 709 W	8.0 oz	14	6.8 a	1.3 d	13.3 h-n	0.5 h	5.8 c-f
24	Disarm 480SC	0.36 fl oz	14	6.8 a	2.8 d	14.0 g-n	6.8 d-h	5.8 c-f
25	Disarm G 0.25G	3.5 lb	14[6]	6.8 a	1.8 d	24.3 d-g	9.8 d-h	5.0 f-i
26	ARY-0473-014 G	3.5 lb	14[6]	6.5 a	5.0 b-d	18.3 f-l	6.3 d-h	5.0 f-i
27	Disarm C 4.25SC	5.9 fl oz	14	6.8 a	1.8 d	22.5 e-h	10.0 d-h	5.5 d-g
28	Disarm M 3.82SC	1.0 fl oz	14	6.8 a	0.5 d	9.0 k-p	8.8 d-h	5.5 d-g

(Continued)

Table 1. Curative control of Pythium blight on perennial ryegrass: Rutgers University, 2009.

	Treatment	Rate per 1000 sq ft	Application Schedule (days)[3]	Turf Area Infected (%) per Plot[1]				Turf Quality[2]
				18 June[4]	24 June	14 July	11 Aug.	11 Aug.
29	Insignia 20WG	0.5 oz	14	6.5 a	3.3 d	12.5 h-o	1.8 gh	6.3 b-e
30	Insignia 20WG + HM9333 27LC	0.5 oz 7.0 fl oz	14	6.5 a	3.8 cd	19.0 f-l	0.0 h	6.8 a-c
31	Heritage TL 0.8ME	2.0 fl oz	14	7.3 a	2.3 d	4.5 n-p	0.5 h	7.0 ab
32	Heritage TL 0.8ME + HM9333 27LC	2.0 fl oz 7.0 fl oz	14	6.8 a	3.3 d	8.3 l-p	2.3 gh	6.3 b-e
33	HM9333 27LC	7.0 fl oz	14	6.5 a	12.5 a	27.0 c-f	20.0 a-d	4.5 g-j
34	IKF-205 28W	1.1 oz	14	6.5 a	4.8 b-d	5.0 n-p	0.0 h	7.8 a
35	Endorse 2.5W	4.0 oz	14	6.5 a	11.0 ab	20.5 e-j	18.8 a-d	3.8 jk
36	Alude 46L	5.0 fl oz	14	6.5 a	2.0 d	12.3 h-o	12.8 c-h	5.3 e-h
37	Untreated check	—	—	6.8 a	10.3 a-c	40.0 ab	19.0 a-d	3.5 jk
			INT[7]	DAT[8]	DAT	DAT	DAT	DAT
			14	—	5	11	11	11
			14[5]	—	2	8	8	8

[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] Fungicides were applied on 19 June (all treatments except treatment 5), 22 June (treatment 5 only), 3 July (14-day treatment), 6 July (treatment 5 only), 17 July (14-day treatment), 20 July (treatment 5 only), 31 July (14-day treatment), and 3 August (treatment 5 only).

[4] Pre-treatment rating taken on 18 June.

[5] Treatment 5 was initiated on 22 June and was reapplied every 14 days through 3 August.

[6] Treatments 25 and 26 were irrigated immediately after application with 0.25 gal of water per plot.

[7] Spray interval in days.

[8] Days after the last treatment.