Preventative Control of Pythium Blight on Perennial Ryegrass

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OBJECTIVE

To determine the efficacy of standard and experimental fungicides for the control of Pythium caused by the organism *Pythium aphanidermatum*.

MATERIALS AND METHODS

The study was conducted at the O. J. Noer Turfgrass Research and Education Facility on a stand of 6-week old perennial ryegrass (*Lolium perenne*) maintained at 2 inches. The individual plots measured 3 feet by 10 feet and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i. using a CO_2 pressurized boom sprayer equipped with two XR Teejet AI8004 nozzles. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft^2. All treatments were applied on July 17th, 2017. Plots were inoculated with *Pythium aphanidermatum* on July 18th and double covered with an Evergreen cover to promote infection. Disease severity and turf quality (1-9, 9 being excellent and 6 acceptable) were visually assessed while chlorophyll content was rated using a FieldScout CM1000 Chlorophyll Meter from Spectrum Technologies, Inc. Turf quality, disease severity, and chlorophyll content were subjected to an analysis of variance and means separated using Fisher's LSD (P = 0.05). Results of disease severity, turfgrass quality, and chlorophyll content ratings can be found in tables 1, 2, and 3, respectively.

RESULTS AND DISCUSSION

Plots were rated 3, 6, and 10 days after inoculation. Disease development was moderate with non-treated controls averaging 46.3% disease on the last rating date. Four of the nine fungicide treatments significantly reduced disease severity but no treatments provided acceptable turf quality at 10 days after inoculation.

Table 1. Mean Pythium severity per treatment on perennial ryegrass at the OJ Noer Turfgrass Research Facility in Madison, WI during 2017.

	Treatment	Rate	Application Interval	Application Code[b]	Pythium Severity[a]		
					Jul 21	Jul 24	Jul 28
1	Non-treated control				8.8 a	22.5 a	46.3 a
2	A14658H Daconil Action	6 fl oz/1000ft2 3.5 fl oz/1000ft2	14 day	KM	0.0 b	0.5 c	10.0 d
3	Signature Xtra Daconil Action	4 oz/1000ft2 3. 5 fl oz/1000ft2	14 day	KM	0.0b	11.3 abc	23.8 bcd
4	A22063A	0.5 fl oz/1000ft2	14 day	KM	1.0 b	22.5 a	38.8 abc
5	A14658C	6 fl oz/1000ft2	14 day	KM	0.0 b	0.0 c	10.0 d
6	Zio Spreader Sticker	0.65 oz/1000ft2 0.25 % v/v	14 day	KM	7.5 a	25.0 a	42.5 ab
7	Zio Spreader Sticker	1.3 oz/1000ft2 0.25 % v/v	14 day	KM	2.3 b	23.8 a	42.5 ab
8	Zio Spreader Sticker	2.6 oz/1000ft2 0.25 % v/v	14 day	KM	2.5 b	23.8 a	37.5 abc
9	Zio Spreader Sticker	5.2 oz/1000ft2 0.25 % v/v	14 day	KM	2.5 b	21.3 a	37.5 abc
10	Segway	0.45 fl oz/1000ft2	14 day	KM	0.0 b	8.0bc	25.0 bcd
				LSD P = .05	3.57	8.83	12.48

[a]Pythium severity was visually assessed as percent disease. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).
[b]Application code K=July 17th, M=August 8th.

Table 2. Mean turfgrass quality per treatment on perennial ryegrass at the OJ Noer Turfgrass Research Facility in Madison, WI during 2017.

	Treatment	Rate	Application Interval	Application Code[b]	Turfgrass Quality[a]		
					Jul 21	Jul 24	Jul 28
1	Non-treated control				5.5 c	5.0 e	3.8 c
2	A14658H Daconil Action	6 fl oz/1000ft2 3.5 fl oz/1000ft2	14 day	KM	7.0 a	7.0 a	5.5 a
3	Signature Xtra Daconil Action	4 oz/1000ft2 3. 5 fl oz/1000ft2	14 day	KM	7.0 a	6.3 abc	4.8 abc
4	A22063A	0.5 fl oz/1000ft2	14 day	KM	6.8 a	5.3 de	4.3 bc
5	A14658C	6 fl oz/1000ft2	14 day	KM	7.0 a	7.0 a	5.5 a
6	Zio Spreader Sticker	0.65 oz/1000ft2 0.25 % v/v	14 day	KM	5.8 bc	5.0 e	4.0 bc
7	Zio Spreader Sticker	1.3 oz/1000ft2 0.25 % v/v	14 day	KM	6.8 a	5.3 de	3.8 c
8	Zio Spreader Sticker	2.6 oz/1000ft2 0.25 % v/v	14 day	KM	6.5 ab	5.3 de	4.5 abc
9	Zio Spreader Sticker	5.2 oz/1000ft2 0.25 % v/v	14 day	KM	6.5 ab	5.5 cde	4.0 bc
10	Segway	0.45 fl oz/1000ft2	14 day	KM	7.0 a	6.5 ab	4.5 abc
				LSD P = .05	0.66	0.59	0.66

[a]Turfgrass quality was rated visually on a 1 – 9 scale with 6 being acceptable. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).
[b]Application code K=July 17th, M=August 8th.

Table 3. Mean chlorophyll rating per treatment on perennial ryegrass at the OJ Noer Turfgrass Research Facility in Madison, WI during 2017.

	Treatment	Rate	Application Interval	Application Code[b]	Chlorophyll Rating[a]		
					Jul 21	Jul 24	Jul 28
1	Non-treated control				423.5 a	337.8 a	250.8 def
2	A14658H Daconil Action	6 fl oz/1000ft2 3.5 fl oz/1000ft2	14 day	KM	477.3 a	453.8 a	412.5 a
3	Signature Xtra Daconil Action	4 oz/1000ft2 3. 5 fl oz/1000ft2	14 day	KM	458.0 a	437.8 a	356.8 ab
4	A22063A	0.5 fl oz/1000ft2	14 day	KM	446.5 a	363.5 a	262.3 c-f
5	A14658C	6 fl oz/1000ft2	14 day	KM	444.8 a	454.8 a	374.8 ab
6	Zio Spreader Sticker	0.65 oz/1000ft2 0.25 % v/v	14 day	KM	433.5 a	326.5 a	227.3 ef
7	Zio Spreader Sticker	1.3 oz/1000ft2 0.25 % v/v	14 day	KM	416.0 a	326.3 a	212.5 f
8	Zio Spreader Sticker	2.6 oz/1000ft2 0.25 % v/v	14 day	KM	425.3 a	324.0 a	240.0 def
9	Zio Spreader Sticker	5.2 oz/1000ft2 0.25 % v/v	14 day	KM	460.5 a	364.5 a	246.5 def
10	Segway	0.45 fl oz/1000ft2	14 day	KM	453.8 a	413.8 a	315.5 bcd
				LSD P = .05	50.34	101.67	49.67

[a]Color was assessed using a FieldScout CM1000 Chlorophyll Meter from Spectrum Technologies, Inc. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).
[b]Application code K=July 17th, M=August 8th.