Dollar Spot Suppression on Golf Course Fairways

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OBJECTIVE

To determine the efficacy of standard and experimental fungicides for controlling dollar spot caused by the fungus *Clarireedia jacksonii* on a creeping bentgrass fairway.

MATERIALS AND METHODS

The study was conducted at the O. J. Noer Turfgrass Research and Education Facility on a stand of 'Penncross' creeping bentgrass (*Agrostis stolonifera*) maintained at 0.5 inches. Individual plots measured 3 feet by 5 feet and were arranged in a randomized complete block design with four replications. Treatments were applied at a nozzle pressure of 40 psi using a CO_2-pressurized boom sprayer equipped with two Teejet AI8004VS 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 initiated on May 27th, 2020 and subsequent applications were made at 14-, 21-, or 28-day intervals. Number of dollar spot foci per plot and turfgrass quality (1-9, 9 being excellent, 6 acceptable, and 1 bare soil) were visually assessed every 2 weeks. Turf quality and disease severity were subjected to an analysis of variance and means separated using Fisher's LSD (P = 0.05). Results of disease severity and turfgrass quality ratings can be found in table 1 and 2, respectively.

RESULTS AND DISCUSSION

Dollar spot pressure was low to medium for the first half of the summer before increasing to very high levels in late July. Non-treated controls averaged more than 102 dollar spot infection centers per plot on the Jul 22 rating date. Despite this high pressure, 9 of the 33 treatments had less than 5 dollar spots per plot and provided complete control of dollar spot and an additional 18 treatments provided statistically similar control to the best performing treatments. Under more moderate pressure on Aug 19 there were 20 treatments that had fewer than 5 dollar spots per plot. Turf quality mostly mirrored disease severity, and 12 of the 33 fungicide treatments provided acceptable turf quality ($\geq$ 6) on the Jul 22 rating date and 24 treatments provided acceptable quality on Aug 19. No phytotoxicity was observed with any treatments.

Table 1. Mean number of dollar spots per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2020.

	Treatment	Rate	Application Interval	Application Code[b]	Dollar Spot Severity[a]		
					Jul 8	Jul 22	Aug 19
1	Non-treated control				28.8 abc	102.3 a-d	52.5 a
2	Maxtima	0.2 FL OZ/1000 FT2	14 day	BDFHJLN	3.0 fg	22.0 h-k	0.3 h
3	Maxtima	0.4 FL OZ/1000 FT2	21 day	BEHKN	1.8 fg	13.3 jk	1.8 gh
4	Maxtima	0.4 FL OZ/1000 FT2	28 day	BFJN	6.8 efg	63.0 d-h	0.3 h
5	Rayora	1.4 FL OZ/1000 FT2	21 day	BEHKN	23.3 cd	95.5 a-d	28.0 bc
6	Xzemplar	0.26 FL OZ/1000 FT2	21 day	BEHKN	1.3 fg	13.8 jk	3.5 gh
7	Encartis	4.0 FL OZ/1000 FT2	21 day	BEHKN	5.8 efg	23.0 h-k	3.5 gh
8	Emerald	0.18 OZ/1000 FT2	21 day	BEHKN	10.5 d-g	29.8 e-k	9.0 e-h
9	Chlorothalonil 720	4.0 FL OZ/1000 FT2	14 day	BDFHJLN	15.0 c-f	60.5 d-i	15.8 c-g
10	Emerald Civitas Pre-M1xed	0.18 OZ/1000 FT2 8.0 FL OZ/1000 FT2	21 day	BEHKN BEHKN	1.8 fg	6.5 jk	5.3 fgh
11	Navicon	0.85 FL OZ/1000 FT2	21 day	BEHKN	1.0 fg	19.5 ijk	1.5 gh
12	Posterity XT	1.5 FL OZ/1000 FT2	21 day	BEHKN	1.5 fg	9.8 jk	8.3 e-h
13	Secure Action	0.5 FL OZ/1000 FT2	14 day	BDFHJLN	1.8 fg	24.5 g-k	0.3 h
14	Secure Action	0.5 FL OZ/1000 FT2	21 day	BEHKN	2.3 fg	28.3 f-k	22.8 b-e
15	Secure	0.5 FL OZ/1000 FT2	14 day	BDFHJLN	2.3 fg	27.5 f-k	0.0 h
16	Secure	0.5 FL OZ/1000 FT2	21 day	BEHKN	7.0 efg	37.8 e-k	12.8 c-h
17	Posterity Forte Secure Action Posterity XT Daconil Action Secure Action Posterity XT Daconil Action Secure Action Secure Action Daconil Action Posterity Forte	0.63 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.63 FL OZ/1000 FT2	21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day	B E H H J L L N P P S	0.8 fg	2.3 k	5.8 fgh
18	Posterity Daconil Action Secure Action Banner Maxx Posterity Heritage Action Secure Action Posterity Daconil Action Secure Action Secure Action Banner Maxx Posterity Daconil Action	0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.0 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 0.2 OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.0 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2	21 day 21 day 21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day 21 day	B B E E H H J L L N P P S S	3.0 fg	12.8 jk	0.3 h
				LSD P=.05	14.65	42.66	15.46

[a]Dollar spot rated as number of dollar spot infection centers per plot. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).

[b]Application Code B = May 27, D = Jun 8, E = Jun 16, F = Jun 23, H = Jul 7, J = Jul 21, K = Jul 28, L = Aug 4, N = Aug 18, P = Sep 1, S = Sep 22.

Table 1 (cont). Mean number of dollar spots per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2020.

	Treatment	Rate	Application Interval	Application Code[b]	Dollar Spot Severity[a]		
					Jul 8	Jul 22	Aug 19
19	Posterity XT Secure Action Posterity XT Daconil Action Secure Action Posterity XT Daconil Action Secure Action Secure Action Daconil Action Posterity XT	1.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2	21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day	B E H H J L L N P P S	2.8 fg	6.8 jk	0.0 h
20	A21461B	0.42 FL OZ/1000 FT2	14 day	BDFHJLN	0.8 fg	1.8 k	0.5 gh
21	A22070C	1.5 FL OZ/1000 FT2	14 day	BDFHJLN	0.5 fg	1.8 k	1.3 gh
22	A19188B	1.0 FL OZ/1000 FT2	14 day	BDFHJLN	6.0 efg	66.0 c-g	0.8 gh
23	A23226B	0.16 FL OZ/1000 FT2	14 day	BDFHJLN	1.5 fg	22.3 h-k	6.5 fgh
24	A23177A	0.2 FL OZ/1000 FT2	14 day	BDFHJLN	5.8 efg	37.3 e-k	0.0 h
25	A21461B	0.42 FL OZ/1000 FT2	21 day	BEHKN	1.3 fg	4.3 k	0.8 gh
26	A21461B	0.63 FL OZ/1000 FT2	21 day	BEHKN	0.8 fg	1.3 k	2.5 gh
27	A22070C	2.2 FL OZ/1000 FT2	21 day	BEHKN	1.3 fg	2.0 k	0.0 h
28	A22070C	3.0 FL OZ/1000 FT2	21 day	BEHKN	0.0 g	0.0 k	0.3 h
29	A19188B	1.0 FL OZ/1000 FT2	21 day	BEHKN	6.3 efg	47.0 e-j	11.0 d-h
30	A23226B	0.21 FL OZ/1000 FT2	21 day	BEHKN	3.3 fg	21.3 h-k	7.0 fgh
31	A23177A	0.4 FL OZ/1000 FT2	21 day	BEHKN	2.5 fg	39.0 e-k	1.0 gh
32	NUP-19022	0.213 FL OZ/1000 FT2	21 day	BEHKN	0.0 g	1.3 k	6.3 fgh
33	NUP-19022 Spectro 90	0.213 FL OZ/1000 FT2 3 OZ/1000 FT2	21 day	BEHKN BEHKN	1.0 fg	2.8 k	2.8 gh
34	Iron Sulfate	6 OZ/1000 FT2	14 day	BDFHJLN	42.5 a	109.3 ab	36.0 b
				LSD P=.05	14.65	42.66	15.46

[a]Dollar spot rated as number of dollar spot infection centers per plot. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).

[b]Application Code B = May 27, D = Jun 8, E = Jun 16, F = Jun 23, H = Jul 7, J = Jul 21, K = Jul 28, L = Aug 4, N = Aug 18, P = Sep 1, S = Sep 22.

Table 2. Mean turfgrass quality per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2020.

	Treatment	Rate	Application Interval	Application Code[b]	Turfgrass Quality[a]		
					Jul 8	Jul 22	Aug 19
1	Non-treated control				5.0 efg	4.3 h	4.8 h
2	Maxtima	0.2 FL OZ/1000 FT2	14 day	BDFHJLN	6.0 bcd	5.3 d-g	7.0 a
3	Maxtima	0.4 FL OZ/1000 FT2	21 day	BEHKN	6.8 ab	5.8 b-e	6.8 ab
4	Maxtima	0.4 FL OZ/1000 FT2	28 day	BFJN	6.5 abc	4.8 fgh	6.5 abc
5	Rayora	1.4 FL OZ/1000 FT2	21 day	BEHKN	5.5 def	4.8 fgh	5.3 fgh
6	Xzemplar	0.26 FL OZ/1000 FT2	21 day	BEHKN	6.8 ab	6.0 bcd	5.8 def
7	Encartis	4.0 FL OZ/1000 FT2	21 day	BEHKN	5.8 cde	5.5 c-f	6.3 bcd
8	Emerald	0.18 OZ/1000 FT2	21 day	BEHKN	5.8 cde	5.3 d-g	5.3 fgh
9	Chlorothalonil 720	4.0 FL OZ/1000 FT2	14 day	BDFHJLN	5.5 def	4.8 fgh	6.8 ab
10	Emerald Civitas Pre-M1xed	0.18 OZ/1000 FT2 8.0 FL OZ/1000 FT2	21 day	BEHKN BEHKN	6.5 abc	6.0 bcd	5.8 def
11	Navicon	0.85 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	5.8 b-e	6.8 ab
12	Posterity XT	1.5 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	5.8 b-e	7.0 a
13	Secure Action	0.5 FL OZ/1000 FT2	14 day	BDFHJLN	6.5 abc	5.3 d-g	7.0 a
14	Secure Action	0.5 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	5.0 e-h	5.5 efg
15	Secure	0.5 FL OZ/1000 FT2	14 day	BDFHJLN	6.5 abc	5.0 e-h	7.0 a
16	Secure	0.5 FL OZ/1000 FT2	21 day	BEHKN	5.8 cde	5.0 e-h	5.5 efg
17	Posterity Forte Secure Action Posterity XT Daconil Action Secure Action Posterity XT Daconil Action Secure Action Secure Action Daconil Action Posterity Forte	0.63 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.63 FL OZ/1000 FT2	21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day	B E H H J L L N P P S	7.0 a	7.0 a	7.0 a
18	Posterity Daconil Action Secure Action Banner Maxx Posterity Heritage Action Secure Action Posterity Daconil Action Secure Action Secure Action Banner Maxx Posterity Daconil Action	0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.0 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 0.2 OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.0 FL OZ/1000 FT2 0.16 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2	21 day 21 day 21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day 21 day	B B E E H H J L L N P P S S	6.3 a-d	5.5 c-f	6.8 ab
				LSD P=.05	0.86	0.86	0.74

[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 B = May 27, D = Jun 8, E = Jun 16, F = Jun 23, H = Jul 7, J = Jul 21, K = Jul 28, L = Aug 4, N = Aug 18, P = Sep 1, S = Sep 22.

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19	Posterity XT Secure Action Posterity XT Daconil Action Secure Action Posterity XT Daconil Action Secure Action Secure Action Daconil Action Posterity XT	1.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 0.5 FL OZ/1000 FT2 2.0 FL OZ/1000 FT2 1.5 FL OZ/1000 FT2	21 day 21 day 14 day 14 day 14 day 14 day 14 day 14 day 21 day 21 day 21 day	B E H H J L L N P P S	6.8 ab	6.5 ab	7.0 a
20	A21461B	0.42 FL OZ/1000 FT2	14 day	BDFHJLN	7.0 a	6.3 abc	7.0 a
21	A22070C	1.5 FL OZ/1000 FT2	14 day	BDFHJLN	6.8 ab	6.5 ab	7.0 a
22	A19188B	1.0 FL OZ/1000 FT2	14 day	BDFHJLN	6.3 a-d	5.0 e-h	7.0 a
23	A23226B	0.16 FL OZ/1000 FT2	14 day	BDFHJLN	6.5 abc	5.3 d-g	5.5 efg
24	A23177A	0.2 FL OZ/1000 FT2	14 day	BDFHJLN	6.3 a-d	5.8 b-e	7.0 a
25	A21461B	0.42 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	6.0 bcd	6.8 ab
26	A21461B	0.63 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	7.0 a	7.0 a
27	A22070C	2.2 FL OZ/1000 FT2	21 day	BEHKN	6.5 abc	6.3 abc	6.8 ab
28	A22070C	3.0 FL OZ/1000 FT2	21 day	BEHKN	7.0 a	7.0 a	7.0 a
29	A19188B	1.0 FL OZ/1000 FT2	21 day	BEHKN	5.5 def	5.0 e-h	5.5 efg
30	A23226B	0.21 FL OZ/1000 FT2	21 day	BEHKN	5.8 cde	5.0 e-h	6.0 cde
31	A23177A	0.4 FL OZ/1000 FT2	21 day	BEHKN	6.3 a-d	5.0 e-h	7.0 a
32	NUP-19022	0.213 FL OZ/1000 FT2	21 day	BEHKN	7.0 a	7.0 a	7.0 a
33	NUP-19022 Spectro 90	0.213 FL OZ/1000 FT2 3 OZ/1000 FT2	21 day	BEHKN	6.5 abc	6.0 bcd	6.8 ab
34	Iron Sulfate	6 OZ/1000 FT2	14 day	BDFHJLN	4.8 fg	4.3 h	4.8 h
				LSD P=.05	0.86	0.86	0.74

[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).

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