Iron Sulfate Interactions for Dollar Spot Control

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OBJECTIVE

To determine how applications of iron sulfate interact with the Smith-Kerns dollar spot prediction model 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 in Madison, WI on a stand of Penncross creeping bentgrass (*Agrostis stolonifera*) maintained at 0.5 inches. Individual plots measured 3 feet by 10 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 XR Teejet AI8004VS nozzles. Iron sulfate was applied as Extreme Green 20 (Simplot), and all treatments 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 27, 2020 and subsequent applications were made at 7-, 14-, or 28-day intervals. Treatments 4 and 5 were applied on a 7-day interval while also using the Smith-Kerns model threshold of 20% with the Clarke Correction (i.e increasing model numbers over a 3-day period). 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 tables 1 and 2, respectively.

RESULTS AND DISCUSSION

Dollar spot severity was high in early July and stayed high through early September. The 7-day calendar iron sulfate treatments resulted in 15 applications over the course of the study while the dollar spot model iron sulfate treatments resulted in 13 applications. Most of the treatments had significant breakthrough under high disease pressure. Only the standard fungicide treatment (Xzemplar) controlled dollar spot to acceptable levels in July and August. Treatments 4 and 5 did not result in better control of dollar spot by using the Smith-Kerns dollar spot prediction model relative to the calendar-based method. 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[a]	Dollar Spot Severity[b]		
					Jul 8	Aug 5	Sep 2
1	Non-treated control				130.3a	355.3a	535.0ab
2	Extreme Green 20	4.5 oz/1000 ft2	7 day	BCDEFGHIJKLMNOP	41.5cd	116.5cd	179.8e
3	Extreme Green 20	6.0 oz/1000 ft2	7 day	BCDEFGHIJKLMNOP	53.8cd	157.5c	156.3e
4	Extreme Green 20	4.5 oz/1000 ft2	7 day SK 20% CC	BCDEFGHIJKLMN	67.0bc	271.0ab	381.0cd
5	Extreme Green 20	6.0 oz/1000 ft2	7 day SK 20% CC	BCDEFGHIJKLMN	57.5c	202.3bc	327.0d
6	Xzemplar	0.26 oz/1000ft2	28 day	BFJN	3.3d	23.8d	23.8f
				LSD P=0.05	50.72	105.83	107.27

[a]Application Code B = May 27, C (trt 2, 3, 7) = Jun 2, C (trt 4, 5) = Jun 4, D = Jun 9, E = Jun 16, F (trt 4, 5) = Jun 22, F (trt 2, 3, 6, 7, 8) = Jun 23, G (trt 4, 5) = Jun 29, G (trt 2, 3, 7) = Jun 30, H = Jul 7, I = Jul 14, J (trt 2, 3, 6, 7, 8) = Jul 21, J (trt 4, 5) = Jul 24, K = Jul 28, L = Aug 4, M (trt 4, 5) = Aug 10, M (trt 2, 3, 7) = Aug 11, N (trt 2, 3, 6, 7, 8) = Aug 18, N (trt 4, 5) = Aug 21, O = Aug 25, P = Sep 1

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

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[a]	Turfgrass Quality[b]		
					Jul 8	Aug 5	Sep 2
1	Non-treated control				4.8cd	4.0c	4.0d
2	Extreme Green 20	4.5 oz/1000 ft2	7 day	BCDEFGHIJKLMNOP	5.3bc	5.5b	5.0b
3	Extreme Green 20	6.0 oz/1000 ft2	7 day	BCDEFGHIJKLMNOP	5.3bc	5.3b	5.0b
4	Extreme Green 20	4.5 oz/1000 ft2	7 day SK 20% CC	BCFGHIJMN	5.3bc	5.0b	4.0d
5	Extreme Green 20	6.0 oz/1000 ft2	7 day SK 20% CC	BCFGHIJMN	5.5b	5.0b	4.5c
6	Xzemplar	0.26 oz/1000ft2	28 day	BFJN	7.0a	7.0a	5.8a
				LSD P=0.05	0.69	0.59	0.38

[a]Application Code B = May 27, C (trt 2, 3, 7) = Jun 2, C (trt 4, 5) = Jun 4, D = Jun 9, E = Jun 16, F (trt 4, 5) = Jun 22, F (trt 2, 3, 6, 7, 8) = Jun 23, G (trt 4, 5) = Jun 29, G (trt 2, 3, 7) = Jun 30, H = Jul 7, I = Jul 14, J (trt 2, 3, 6, 7, 8) = Jul 21, J (trt 4, 5) = Jul 24, K = Jul 28, L = Aug 4, M (trt 4, 5) = Aug 10, M (trt 2, 3, 7) = Aug 11, N (trt 2, 3, 6, 7, 8) = Aug 18, N (trt 4, 5) = Aug 21, O = Aug 25, P = Sep 1

[b]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).