



Iron Sulfate and Urea Interactions for Dollar Spot Control

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OBJECTIVE

To determine how applications of iron sulfate interact with applications of urea for controlling dollar spot caused by the fungus *Sclerotinia homoeocarpa* on fairway-height creeping bentgrass.

MATERIALS AND METHODS

The study was conducted at the O. J. Noer Turfgrass Research and Education Facility on a stand of 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 CO₂-pressurized boom sprayer equipped with two XR Teejet AI8004 VS nozzles. All treatments were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft². All treatments were initiated on May 29th and subsequent applications were made at 7, 14, 28, or 42-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 did not develop in the plots until late July. All treatments significantly reduced dollar spot severity when compared to the nontreated control. Treatments 4, 5, 6, 8, 9, 10, 12, 13, 14, and 15 performed the best throughout the course of the season. Urea by itself did not control dollar spot to an acceptable level regardless of the rate and spray interval. Iron sulfate by itself on a 14-day interval did not control dollar spot to an acceptable level, but iron sulfate by itself on a 7-day interval did. Urea and iron sulfate together only controlled dollar spot to an acceptable level when applied on a 7-day interval. Xzemplar by itself on a 42-day interval performed moderately well, but the addition of urea, iron sulfate, or both, increased the control of dollar spot.

Table 1. Mean number of dollar spots per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2019.

Treatment	Rate	Application Interval	Application Code ^b	Dollar Spot Severity ^a		
				Jul 9	Aug 21	Sep 4
1 Non-treated control				13.5a	110.3a	316.0a
2 Urea	0.1 lb N/1000 ft ²	7 day	CDEFGHIJKLMNOPQR	14.0a	47.0a	173.5b
3 Urea	0.2 lb N/1000ft ²	14 day	CEGIKMOQ	10.3ab	29.5ab	148.8b
4 Urea Xzemplar	0.2 lb N/1000ft ² 0.26 oz/1000ft ²	14 day 28 day	CEGIKMOQ CGKO	0.5b	0.0b	0.0d
5 Urea Xzemplar	0.2 lb N/1000ft ² 0.26 fl oz/1000ft ²	14 day 42 day	CEGIKMOQ CIO	0.0b	0.8b	1.3d
6 Iron Sulfate	6.0 oz/1000ft ²	7 day	CDEFGHIJKLMNOPQR	0.8b	2.5b	9.8d
7 Iron Sulfate	6.0 oz/1000ft ²	14 day	CEGIKMOQ	8.8ab	16.8ab	61.8c
8 Iron Sulfate Xzemplar	6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 28 day	CEGIKMOQ CGKO	1.0b	0.0b	0.0d
9 Iron Sulfate Xzemplar	6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 42 day	CEGIKMOQ CIO	1.5b	0.0b	0.0d
10 Urea Iron Sulfate	0.1 lb N/1000ft ² 6.0 oz/1000ft ²	7 day	CDEFGHIJKLMNOPQR CDEFGHIJKLMNOPQR	0.0b	0.0b	14.3d
11 Urea Iron Sulfate	0.2 lb N/1000ft ² 6.0 oz/1000ft ²	14 day	CEGIKMOQ CEGIKMOQ	0.8b	6.5b	80.0c
12 Urea Iron Sulfate Xzemplar	0.2 lb N/1000ft ² 6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 14 day 28 day	CEGIKMOQ CEGIKMOQ CGKO	0.0b	0.0b	2.8d
13 Urea Iron Sulfate Xzemplar	0.2 lb N/1000ft ² 6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 14 day 42 day	CEGIKMOQ CEGIKMOQ CIO	0.0b	0.0b	0.0d
14 Xzemplar	0.26 fl oz/1000ft ²	28 day	CGKO	0.0b	0.8b	0.0d
15 Xzemplar	0.26 fl oz/1000ft ²	42 day	CIO	3.5ab	16.8ab	4.5d
LSD P=0.05				10.52	17.38	39.86

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

^bApplication Code C=May 29, D=Jun 4, E=Jun 11, F=Jun 18, G=Jun 25, H=July 2, I=July 9, J=July 16, K=July 24, L=July 30, M=Aug 6, N=Aug 13, O=Aug 20, P=Aug 27, Q=Sep 3, R=Sep 10

Table 2. Mean turfgrass quality per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2019.

Treatment	Rate	Application Interval	Application Code ^b	Turfgrass Quality ^a		
				Jul 9	Aug 21	Sep 4
1 Non-treated control				6.0cd	4.3d	3.8f
2 Urea	0.1 lb N/1000 ft ²	7 day	CDEFGHIJKLMNOPQR	5.5d	4.8cd	4.5ef
3 Urea	0.2 lb N/1000ft ²	14 day	CEGIKMOQ	6.0cd	4.8cd	5.0de
4 Urea Xzemplar	0.2 lb N/1000ft ² 0.26 oz/1000ft ²	14 day 28 day	CEGIKMOQ CGKO	7.0a-d	7.0a	7.3a
5 Urea Xzemplar	0.2 lb N/1000ft ² 0.26 fl oz/1000ft ²	14 day 42 day	CEGIKMOQ CIO	7.0a-d	7.0a	7.3a
6 Iron Sulfate	6.0 oz/1000ft ²	7 day	CDEFGHIJKLMNOPQR	7.0a-d	6.5a	7.3a
7 Iron Sulfate	6.0 oz/1000ft ²	14 day	CEGIKMOQ	5.8d	5.0c	5.3de
8 Iron Sulfate Xzemplar	6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 28 day	CEGIKMOQ CGKO	7.5abc	7.0a	7.5a
9 Iron Sulfate Xzemplar	6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 42 day	CEGIKMOQ CIO	7.5abc	6.8a	7.3a
10 Urea Iron Sulfate	0.1 lb N/1000ft ² 6.0 oz/1000ft ²	7 day	CDEFGHIJKLMNOPQR CDEFGHIJKLMNOPQR	7.0a-d	6.5a	6.3bc
11 Urea Iron Sulfate	0.2 lb N/1000ft ² 6.0 oz/1000ft ²	14 day	CEGIKMOQ CEGIKMOQ	5.5d	5.8b	5.5cd
12 Urea Iron Sulfate Xzemplar	0.2 lb N/1000ft ² 6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 14 day 28 day	CEGIKMOQ CEGIKMOQ CGKO	8.0a	7.0a	6.8ab
13 Urea Iron Sulfate Xzemplar	0.2 lb N/1000ft ² 6.0 oz/1000ft ² 0.26 fl oz/1000ft ²	14 day 14 day 42 day	CEGIKMOQ CEGIKMOQ CIO	7.8ab	7.0a	7.3a
14 Xzemplar	0.26 fl oz/1000ft ²	28 day	CGKO	7.0a-d	6.8a	6.8ab
15 Xzemplar	0.26 fl oz/1000ft ²	42 day	CIO	6.3bcd	5.8b	7.0ab
LSD P=0.05				1.61	0.75	0.83

^aTurfgrass 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).

^bApplication Code C=May 29, D=Jun 4, E=Jun 11, F=Jun 18, G=Jun 25, H=July 2, I=July 9, J=July 16, K=July 24, L=July 30, M=Aug 6, N=Aug 13, O=Aug 20, P=Aug 27, Q=Sep 3, R=Sep 10