Dollar spot suppression on golf course fairways using diferulate mixtures

Kurt Hockemeyer, Amanda Bender, Jeremy Persinger, Michael Ramirez,
and Paul Koch, Ph.D.
Department of Plant Pathology
University of Wisconsin - Madison

OBJECTIVE

To determine the efficacy of diferulate molecules 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 mixed stand of 'Penncross' creeping bentgrass (*Agrostis stolonifera*) and annual bluegrass (*Poa annua*) 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 sprayer equipped with one Teejet AI9508EVS nozzle. 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 June 25th, 2025, and subsequent applications were made at 14- or 21-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. Area under the disease progress curve (AUDPC) and area under the turf quality curve (AUTQC) were calculated using the trapezoidal method and summarize the whole season disease severity and turf quality and are included in tables 1 and 2, respectively.

RESULTS AND DISCUSSION

Dollar spot pressure was moderately high throughout the study with nontreated controls averagingover 38 infection centers per plot on the peak disease Jul 23 rating date. The diferulate and iron sulfate mixtures did not reduce dollar spot severity, but the standard and experimental fungicides were highly effective at suppressing dollar spot. Significant phytotoxicity was observed with the highest rate of the diferulate mixture but was no longer present 2-3 days after application. Turf quality mirrored disease severity.

Table 1. Mean number of dollar spots per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2025.

	Treatment	Rate	Application Interval	Application Code[b]	Dollar Spot Severity[a] July 9th	Dollar Spot Severity July 23rd	Dollar Spot Severity Aug 6th	Dollar Spot Severity AUDPC[c]
1	Non-treated control				7.0abc	38.8b	37.8b	1181.3bc
2	DF Mixture Adjuvant	3.88 fl oz/1000 ft2 0.776 fl oz/1000 ft2	14 day	HJLNP	11.3a	80.3a	66.8a	2227.8a
3	DF Mixture Adjuvant	19.4 fl oz/1000 ft2 3.88 fl oz/1000 ft2	14 day	HJLNP	4.5bcd	45.5b	30.5bcd	1127.0bc
4	DF Mixture Adjuvant	38.8 fl oz/1000 ft2 7.76 fl oz/1000 ft2	14 day	HJLNP	2.8bcd	25.0bcd	14.3de	588.0cde
5	Extreme Green 20	3.0 oz/1000 ft2	14 day	HJLNP	6.5abc	36.3b	32.5bc	1053.5bc
6	DF Mixture Adjuvant Extreme Green 20	3.88 fl oz/1000 ft2 0.776 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	5.5a-d	47.0b	34.8bc	1221.5bc
7	DF Mixture Adjuvant Extreme Green 20	19.4 fl oz/1000 ft2 3.88 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	4.5bcd	34.5bc	17.3cde	789.3bcd
8	DF Mixture Adjuvant Extreme Green 20	38.8 fl oz/1000 ft2 7.76 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	8.3ab	51.3ab	31.0bcd	1267.0b
9	Secure Action	0.5 fl oz/1000 ft2	14 day	HJLNP	3.8bcd	4.0cd	2.8e	150.5de
10	Fluoxy-T	1.16 fl oz/1000 ft2	21 day	HKN	1.3cd	0.0d	3.5e	66.5e
11	ALB-3007	1.0 fl oz/1000 ft2	21 day	HKN	0.0d	0.3d	0.3e	14.0e
12	ALB-3007 Azoxy 22.9%	1.0 fl oz/1000 ft2 0.33 fl oz/1000 ft2	21 day	HKN	0.0d	0.3d	0.3e	7.0e
13	ALB-3007 ALB-5013	1.0 fl oz/1000 ft2 0.25 % v/v	21 day	HKN	0.5d	0.0d	0.5e	14.0e
14	ALB-3007 ALB-2025	1.0fl oz/1000 ft2 0.25 % v/v	21 day	HKN	0.3d	0.0d	0.5e	10.5e
				LSD P =.05	5.84	31.0	17.9	666.54

[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: H = Jun 25th, J = Jul 9th, K = Jul 16th, L = Jul 24th, N = Aug 6th, P = Aug 19th

[c]Area under the disease progress curve (AUDPC) was calculated using the trapezoidal method.

Table 2. Mean turfgrass quality per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2025.

	Treatment	Rate	Application Interval	Application Code[b]	Turfgrass Quality[a] July 9th	Turfgrass Quality July 23rd	Turfgrass Quality Aug 6th	Turfgrass Quality AUTQC[c]
1	Non-treated control				5.3d	4.8c	4.8c	286.8cd
2	DF Mixture Adjuvant	3.88 fl oz/1000 ft2 0.776 fl oz/1000 ft2	14 day	HJLNP	5.3d	4.8c	4.8c	285.0d
3	DF Mixture Adjuvant	19.4 fl oz/1000 ft2 3.88 fl oz/1000 ft2	14 day	HJLNP	5.5d	5.0c	5.5bc	305.0cd
4	DF Mixture Adjuvant	38.8 fl oz/1000 ft2 7.76 fl oz/1000 ft2	14 day	HJLNP	5.5d	5.0c	5.0c	297.0cd
5	Extreme Green 20	3.0 oz/1000 ft2	14 day	HJLNP	5.5d	5.0c	5.0c	295.5cd
6	DF Mixture Adjuvant Extreme Green 20	3.88 fl oz/1000 ft2 0.776 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	5.3d	4.8c	4.8c	289.8cd
7	DF Mixture Adjuvant Extreme Green 20	19.4 fl oz/1000 ft2 3.88 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	5.8cd	5.0c	5.3c	308.3c
8	DF Mixture Adjuvant Extreme Green 20	38.8 fl oz/1000 ft2 7.76 fl oz/1000 ft2 3.0 oz/1000 ft2	14 day	HJLNP	5.5d	4.5c	5.0c	289.8cd
9	Secure Action	0.5 fl oz/1000 ft2	14 day	HJLNP	6.0bcd	6.0b	6.8a	343.5b
10	Fluoxy-T	1.16 fl oz/1000 ft2	21 day	HKN	6.5abc	7.0a	6.3ab	354.5ab
11	ALB-3007	1.0 fl oz/1000 ft2	21 day	HKN	6.8ab	7.0a	6.5a	368.0a
12	ALB-3007 Azoxy 22.9%	1.0 fl oz/1000 ft2 0.33 fl oz/1000 ft2	21 day	HKN	7.0a	7.0a	6.8a	368.5a
13	ALB-3007 ALB-5013	1.0 fl oz/1000 ft2 0.25 % v/v	21 day	HKN	7.0a	7.0a	6.3ab	363.5ab
14	ALB-3007 ALB-2025	1.0fl oz/1000 ft2 0.25 % v/v	21 day	HKN	6.8ab	7.0a	6.5a	359.8ab
				LSD P =.05	0.76	0.5	0.75	21.58

[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: H = Jun 25th, J = Jul 9th, K = Jul 16th, L = Jul 24th, N = Aug 6th, P = Aug 19th

[c]Area under the disease progress curve (AUDPC) was calculated using the trapezoidal method.