Optimizing dollar spot control using potassium bicarbonate and pigments

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

OBJECTIVE

To investigate whether the alkaline compound potassium bicarbonate can suppress dollar spot caused by the fungus *Clarireedia jacksonii* in combination with various pigments 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 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 sprayer equipped with one Teejet AI9508EVS nozzle. All treatments were agitated by hand and applied in 1.5 gallons of water per 1000 ft^2. All treatments were initiated on May 29th, 2025, and subsequent applications were made at 14-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 tables 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 extremely high with nontreated controls averaging over 569 infection centers per plot on the peak disease Jul 23 rating date. The potassium bicarbonate treatments significantly reduced disease compared to the non-treated control but failed to produced acceptable levels of suppression for most of the summer. The addition of Civitas did not further suppress dollar spot, though the addition of pigments as a whole did marginally increase turf quality.

Table 1. Mean dollar spot severity per treatment on creeping bentgrass maintained at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2025.

	Treatment	Water Carrier Volume	Application Code[b]	App Interval	Dollar Spot Severity[a] Jul 9	Dollar Spot Severity Jul 23	Dollar Spot Severity Aug 6	Dollar Spot Severity AUDPC[c]
1	Non-treated control				321.0a	569.5a	326.8a	18511.5a
2	Potassium bicarbonate	1.7 lb/1000 ft²	DFHJLNPR	14 day	60.5bc	272.0b	129.3cde	6471.5c
3	Potassium bicarbonate	0.85 lb/1000 ft²	DFHJLNPR	14 day	175.3b	484.0a	191.8b	12285.0b
4	Civitas Pre-Mixed	8.0 fl oz/1000 ft²	DFHJLNPR	14 day	206.8b	495.0a	184.5bc	12460.0b
5	Potassium bicarbonate Par	1.7 lb/1000 ft² 0.37 fl oz/1000 ft²	DFHJLNPR	14 day	39.5dc	260.0b	104.5de	5659.5c
6	Potassium bicarbonate Par	0.85 lb/1000 ft² 0.37 fl oz/1000 ft²	DFHJLNPR	14 day	145.0bc	514.8a	157.8bcd	11483.5b
7	Potassium bicarbonate Civitas Pre-Mixed	1.7 lb/1000 ft² 8.0 fl oz/1000 ft²	DFHJLNPR	14 day	12.0e	284.5b	94.0e	5474.0c
8	Potassium bicarbonate Civitas Pre-Mixed	0.85 lb/1000 ft² 8.0 fl oz/1000 ft²	DFHJLNPR	14 day	99.5cd	475.0a	151.5b-e	10209.5b
				LSD P=.05	64.52	150.34	57.7	2450.29

[a]Dollar spot was 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: D = May 29th, F = Jun 10th, H = Jun 24th, J = Jul 8th, L = Jul 22nd, 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 on creeping bentgrass maintained at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2025.

	Treatment	Water Carrier Volume	Application Code[b]	App Interval	Turfgrass Quality[a] July 9th	Turfgrass Quality July 23rd	Turfgrass Quality Aug 6th	Turfgrass Quality AUTQC[c]
1	Non-treated control				4.3d	4.3d	4.0d	329.5e
2	Potassium bicarbonate	1.7 lb/1000 ft²	DFHJLNPR	14 day	5.3bc	5.3bc	5.5b	395.5bc
3	Potassium bicarbonate	0.85 lb/1000 ft²	DFHJLNPR	14 day	4.8cd	4.8cd	4.8c	366.3d
4	Civitas Pre-Mixed	8.0 fl oz/1000 ft²	DFHJLNPR	14 day	5.0c	5.0c	4.8c	377.3cd
5	Potassium bicarbonate Par	1.7 lb/1000 ft² 0.37 fl oz/1000 ft²	DFHJLNPR	14 day	6.5a	6.5a	5.8ab	449.3a
6	Potassium bicarbonate Par	0.85 lb/1000 ft² 0.37 fl oz/1000 ft²	DFHJLNPR	14 day	5.0c	5.0c	4.8c	375.3cd
7	Potassium bicarbonate Civitas Pre-Mixed	1.7 lb/1000 ft² 8.0 fl oz/1000 ft²	DFHJLNPR	14 day	5.8b	5.8b	6.3a	420.8b
8	Potassium bicarbonate Civitas Pre-Mixed	0.85 lb/1000 ft² 8.0 fl oz/1000 ft²	DFHJLNPR	14 day	5.0c	5.0c	5.5b	390.0cd
				LSD P=.05	0.52	0.52	0.71	27.76

[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: D = May 29th, F = Jun 10th, H = Jun 24th, J = Jul 8th, L = Jul 22nd, N = Aug 6th, P = Aug 19th
[c]Area under the turf quality curve (AUTQC) was calculated using the trapezoidal method.