



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 CO₂-pressurized sprayer equipped with one Teejet AI9508EVS nozzle. All treatments were agitated by hand and applied in 1.5 gallons of water per 1000 ft². All treatments were initiated on May 27th, 2026, and subsequent applications were made at 14-day intervals. Number of dollar spot foci per plot, phytotoxicity, and turfgrass quality (1-9, 9 being excellent, 6 acceptable, and 1 bare soil) were visually assessed every 2 weeks. Turf quality, phytotoxicity, and disease severity were subjected to an analysis of variance and means separated using Fisher's LSD ($P = 0.05$). Results of disease severity, turfgrass quality, and phytotoxicity ratings can be found in tables 1, 2, and 3, respectively. Area under the disease progress curve (AUDPC), area under the turf quality curve (AUTQC), and area under the phytotoxicity curve (AUPC) were calculated using the trapezoidal method and summarize the whole season disease severity, turf quality, and phytotoxicity, and are included in tables 1, 2, and 3, respectively.

Results and Discussion

Dollar spot pressure was high starting in mid-July with nontreated controls averaging 184 infection centers per plot on the peak disease rating date of Aug 26. The potassium bicarbonate treatments significantly reduced disease compared to the non-treated control but failed to produce acceptable levels of suppression for most of the summer. The addition of Civitas to the low rate of potassium bicarbonate did statistically improve dollar spot control. The addition of pigments as a whole did increase turf quality and improve phytotoxicity ratings.

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 2026.

Ref #	Treatment	Application Rate	Application Code	Dollar Spot Severity July 29 th	Dollar Spot Severity Aug 12 th	Dollar Spot Severity Aug 26 th	Dollar Spot Severity AUDPC
1	Non-treated control	NA	NA	64.5a	165.8a	184.0a	5463.5a
2	Potassium bicarbonate	1.7 lb/1000 ft ²	CEGIKMO	8.8c	63.3de	83.5cd	1750.0de
3	Potassium bicarbonate	0.85 lb/1000 ft ²	CEGIKMO	37.3ab	112.3bc	118.8bc	3288.3bc
4	Civitas Pre-Mixed	8.0 fl oz/1000 ft ²	CEGIKMO	60.0a	129.8b	139.0ab	3979.5b
5	Potassium bicarbonate Par	1.7 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	3.5c	40.3ef	71.0de	1155.0de
6	Potassium bicarbonate Par	0.85 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	23.3bc	88.5cd	101.3bcd	2388.8cd
7	Potassium bicarbonate Civitas Pre-Mixed	1.7 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	3.3c	23.5f	30.5e	630.0e
8	Potassium bicarbonate Civitas Pre-Mixed	0.85 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	11.0bc	61.5de	63.3de	1527.8de
NA	NA	NA	LSD P=.05	27.4	31.68	46.74	1376.08

Tables Notes by Column

- **Application Code** - C = May 27th, E = June 10th, G = June 25th, I = July 8th, K = July 22nd, M = August 5th, O = August 18th
- **Dollar Spot Severity** - 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).
- **AUDPC** - Area under the disease progress curve 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 2026.

Ref #	Treatment	Application Rate	Application Code	Turfgrass Quality July 29 th	Turfgrass Quality Aug 12 th	Turfgrass Quality Aug 26 th	Turfgrass Quality AUTQC
1	Non-treated control	NA	NA	4.3d	4.3f	4.0d	448.0d
2	Potassium bicarbonate	1.7 lb/1000 ft ²	CEGIKMO	5.8ab	5.3bcd	4.8bc	502.3bc
3	Potassium bicarbonate	0.85 lb/1000 ft ²	CEGIKMO	5.3bc	4.8def	4.3cd	481.3cd
4	Civitas Pre-Mixed	8.0 fl oz/1000 ft ²	CEGIKMO	4.5cd	4.5ef	4.0d	448.0d
5	Potassium bicarbonate Par	1.7 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	5.8ab	5.8ab	4.8bc	519.8ab
6	Potassium bicarbonate Par	0.85 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	5.3bc	5.0cde	4.5cd	500.5abc
7	Potassium bicarbonate Civitas Pre-Mixed	1.7 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	6.0ab	6.0a	5.5a	511.0abc
8	Potassium bicarbonate Civitas Pre-Mixed	0.85 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	6.3a	5.5abc	5.3ab	537.3a
NA	NA	NA	LSD P=.05	0.85	0.68	0.7	32.96

Tables Notes by Column

- **Application Code** - C = May 27th, E = June 10th, G = June 25th, I = July 8th, K = July 22nd, M = August 5th, O = August 18th
- **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).
- **AUTQC** - Area under the turf quality curve was calculated using the trapezoidal method.

Table 3: Mean phytotoxicity rating per treatment on creeping bentgrass maintained at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2026.

Ref #	Treatment	Application Rate	Application Code	Phytotoxicity Rating July 29 th	Phytotoxicity Rating Aug 12 th	Phytotoxicity Rating Aug 26 th	Phytotoxicity Rating AUPC
1	Non-treated control	NA	NA	7.0a	7.0a	7.0a	539.0a
2	Potassium bicarbonate	1.7 lb/1000 ft ²	CEGIKMO	6.0b	7.0a	6.3b	495.3c
3	Potassium bicarbonate	0.85 lb/1000 ft ²	CEGIKMO	7.0b	7.0a	7.0a	525.0b
4	Civitas Pre-Mixed	8.0 fl oz/1000 ft ²	CEGIKMO	7.0b	7.0a	7.0a	539.0a
5	Potassium bicarbonate Par	1.7 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	6.3b	7.0a	6.8a	516.3b
6	Potassium bicarbonate Par	0.85 lb/1000 ft ² 0.37 fl oz/1000 ft ²	CEGIKMO	7.0a	7.0a	7.0a	539.0a
7	Potassium bicarbonate Civitas Pre-Mixed	1.7 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	6.0b	7.0a	6.8a	484.8c
8	Potassium bicarbonate Civitas Pre-Mixed	0.85 lb/1000 ft ² 8.0 fl oz/1000 ft ²	CEGIKMO	7.0a	7.0a	7.0a	539.0a
NA	NA	NA	LSD P=.05	0.26	NA	0.47	13.89

Tables Notes by Column

- **Application Code** - C = May 27th, E = June 10th, G = June 25th, I = July 8th, K = July 22nd, M = August 5th, O = August 18th
- **Phytotoxicity Rating** - was rated visually on a 1 – 7 scale with 7 being no phytotoxicity present. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).
- **AUPC** - Area under the phytotoxicity curve was calculated using the trapezoidal method.