



Dollar Spot Suppression on Golf Course Fairways using Aerial Application Methods

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Objective

To determine the efficacy of aerial application methods for controlling dollar spot caused by the fungus *Clariireedia jacksonii* on a golf course 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. Drone plots measured 12.5 feet by 100 feet and contained 4 randomly placed subplots measuring 3 ft by 5 ft within each. Ground-based plots measured 3 ft by 5 ft and were placed near the drone plots in a randomized complete block design with 4 replications. Ground-based treatments were applied at a nozzle pressure of 40 psi using a CO₂-pressurized sprayer equipped with one Teejet AI9508EVS nozzle and in a water volume of 1.5 gal per M (66 gal per A). Aerial treatments were applied using a drone sprayer at water volumes of either 0.115 or 0.34 gal per M (5 or 15 gal per A, respectively) using a rotary atomizer disc nozzle. All treatments were initiated on May 27th, 2026, 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 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 high starting in late July with nontreated controls averaging over 81 infection centers per plot on Aug 12. All treatments significantly reduced dollar spot in comparison to the non-treated control and there was no difference in dollar spot severity between the ground-based and aerial application treatments. All the treatments were of acceptable turf quality except for the Daconil treatments on Aug 12. No phytotoxicity was observed with any treatment. This second year of data concurs with the first year's data indicating that drone sprayers show promise for effective dollar spot control even at exceedingly low carrier volumes. Further research is needed to evaluate the viability of drone spraying on golf courses.

Table 1: Mean number of dollar spots per treatment at fairway height at the OJ Noer Turfgrass Research Facility in Madison, WI during 2026.

Ref #	Treatment	Rate	Spray Volume	Application Code	Dollar Spot Severity July 15 th	Dollar Spot Severity July 29 th	Dollar Spot Severity Aug 12 th	Dollar Spot Severity AUDPC
1	Non-treated control	NA	NA	NA	15.5a	36.0a	81.8a	1324.8a
2	Daconil Weatherstik	5.5 fl oz/1000 ft ²	5 gal/A	CEGIK	0.0b	0.0b	10.0bc	70.0b
3	Daconil Weatherstik	5.5 fl oz/1000 ft ²	15 gal/A	CEGIK	0.0b	0.0b	16.3b	120.8b
4	Banner Maxx	2.0 fl oz/1000 ft ²	5 gal/A	CEGIK	0.0b	0.0b	5.8bc	43.8b
5	Banner Maxx	2.0 fl oz/1000 ft ²	15 gal/A	CEGIK	0.0b	0.0b	5.8bc	40.3b
6	Daconil Weatherstik	5.5 fl oz/1000 ft ²	66 gal/A	CEGIK	0.0b	0.0b	15.5b	115.5b
7	Banner Maxx	2.0 fl oz/1000 ft ²	66 gal/A	CEGIK	0.0b	0.0b	0.0c	10.5b
NA	NA	NA	NA	LSD P=.05	5.26	10.85	13.41	287.42

Table Notes by Column Name

- **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).
- **Application Code** - C = May 27th, E = June 9th, G = June 25th, I = July 8th, K = July 22nd
- **AUDPC** - Area under the disease progress curve 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 2026.

Ref #	Treatment	Rate	Spray Volume	Application Code	Turfgrass Quality July 15 th	Turfgrass Quality July 29 th	Turfgrass Quality Aug 12 th	Turfgrass Quality AUTQC
1	Non-treated control	NA	NA	NA	5.5b	4.5b	4.0d	407.8b
2	Daconil Weatherstik	5.5 fl oz/1000 ft ²	5 gal/A	CEGIK	7.0a	7.0a	5.5c	479.5a
3	Daconil Weatherstik	5.5 fl oz/1000 ft ²	15 gal/A	CEGIK	6.8a	7.0a	5.8bc	477.8a
4	Banner Maxx	2.0 fl oz/1000 ft ²	5 gal/A	CEGIK	7.0a	7.0a	6.0bc	477.8a
5	Banner Maxx	2.0 fl oz/1000 ft ²	15 gal/A	CEGIK	7.0a	7.0a	6.3b	484.8a
6	Daconil Weatherstik	5.5 fl oz/1000 ft ²	66 gal/A	CEGIK	7.0a	7.0a	5.5c	479.5a
7	Banner Maxx	2.0 fl oz/1000 ft ²	66 gal/A	CEGIK	7.0a	7.0a	7.3a	491.8a
NA	NA	NA	NA	LSD P=.05	0.42	0.32	0.66	16.16

Table Notes by Column Name

- **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).
- **Application Code** - C = May 27th, E = June 9th, G = June 25th, I = July 8th, K = July 22nd
- **AUTQC** - Area under the turf quality curve was calculated using the trapezoidal method.