



Determining Effective Smith-Kerns Dollar Spot Thresholds for Cultivars with Increased Dollar Spot Resistance

Kurt Hockemeyer, Michael Ramirez, Jeremy Persinger, Amanda Bender, and Paul Koch, Ph.D.

Department of Plant Pathology
University of Wisconsin - Madison

Objective

To evaluate various Smith-Kerns dollar spot model spray thresholds for use on creeping bentgrass cultivars with varying levels of dollar spot resistance.

Materials and Methods

The study was conducted at the O. J. Noer Turfgrass Research and Education Facility. The plot consisted of subplots of 3 different varieties of creeping bentgrass with 3 replications maintained at a 0.5-inch mowing height. The three bentgrass varieties used were Coho (Vista Seed Partners, Shedd, OR), Shark (Tessman Co., St. Paul, MN), and Penncross (Tee-2-Green, Hubbard, OR) to represent high, medium, and low resistance to dollar spot, respectively. Within each cultivar were six treatments: a nontreated control, Secure Action applied every 14 days on a calendar basis, and Secure Action applied at various Smith-Kerns Dollar Spot Model prediction thresholds. All Secure Action treatments were applied at the same rate of 0.5 fl oz/1000 ft². All fungicides were applied at a nozzle pressure of 40 psi using a CO₂-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 ft². 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 moderate in 2026 until mid-July when an increase in dollar spot severity occurred until the peak disease rating date of August 26th. On this date, the non-treated controls for Penncross, Shark, and Coho averaged 158.3, 67.3, and 17 dollar spot foci per plot, respectively. The AUDPC for the nontreated plots showed a moderate increase in natural resistance to dollar spot from Shark when compared to Penncross. And Coho exhibited a marked increase in resistance from the other cultivars. Variability in dollar spot severity was seen across all thresholds and all cultivars. Penncross broke down at 30%, but oddly not at 35%, despite having 2 less fungicide applications. Shark broke down at its lowest threshold of 25%, but the

higher 3 thresholds all controlled dollar spot well. Coho saw all 4 thresholds perform well up to 60%. However, Coho was able to control dollar spot the remainder of the season after that respective date across all thresholds. This breakdown of thresholds may be due to various factors, but it is important to mention relative humidity and average temperatures were highly variable from week to week after mid-July, affecting the Smith-Kerns prediction model greatly.

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	Application Code	App Interval	Dollar Spot Severity July 29 th	Dollar Spot Severity Aug 12 th	Dollar Spot Severity Aug 26 th	Dollar Spot Severity AUDPC
1	Coho Nontreated Control	NA	NA	8.3bc	18.7cde	17.0def	651.0cde
2	Coho Secure Action	BDFHJLN	14 day	0.0c	0.0e	0.0f	4.7e
3	Coho Secure Action	EHN	45%	2.0bc	10.3de	0.0f	172.7de
4	Coho Secure Action	EHN	50%	5.0bc	27.0bcd	9.0ef	576.3cde
5	Coho Secure Action	HN	55%	1.7bc	25.3bcd	5.0f	422.3de
6	Coho Secure Action	HN	60%	0.0c	18.0cde	1.7f	277.7de
7	Shark Nontreated Control	NA	NA	17.0b	40.0b	67.3b	1418.7b
8	Shark Secure Action	BDFHJLN	14 day	0.0c	10.3de	9.3ef	210.0de
9	Shark Secure Action	EHJLNP	25%	15.3bc	37.3bc	39.7c	1183.0bc
10	Shark Secure Action	EHJLN	30%	5.0bc	17cde	8.7ef	406.0de
11	Shark Secure Action	EHKLN	35%	5.3bc	7.7de	0.7f	224.0de
12	Shark Secure Action	EHMO	40%	3.7bc	6.7de	0.7f	261.3de
13	Penncross Nontreated Control	NA	NA	89.0a	122.7a	158.3a	4888.3a
14	Penncross Secure Action	BDFHJLN	14 day	0.7c	10.7de	27.0cde	352.3de
15	Penncross Secure Action	EGILNP	20%	2.7bc	24.0bcd	29.0cd	576.3cde
16	Penncross Secure Action	EHJLNP	25%	2.7bc	18.0cde	37.3c	597.3cde
17	Penncross Secure Action	EHJLN	30%	6.7bc	24.0bcd	17.7def	749.0bcd
18	Penncross Secure Action	EHKLN	35%	0.0c	0.0e	0.0f	28.0e
NA	NA	NA	LSD P=.05	15.88	20.95	18.84	670.26

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** - B = May 21st (cal), D = Jun 3rd (cal), E = Jun 10th (trt. 9, 10, 15, 16, 17), E = Jun 11th (trt. 3, 4, 11, 12, 18), F = Jun 18th (cal), G = Jun 26th (trt. 15), H = Jun 29th (trt. 9, 16), H = Jun 30th (10, 11, 17, 18), H = Jul 1st (trt. 3, 4, 5, 6, 12, cal), I = Jul 10th (trt. 15), J = Jul 13th (trt. 9, 16), J = Jul 14th (trt. 10, 17), J = Jul 16th (cal), K = Jul 20th (trt. 11, 18), L = Jul 28th (trt. 9, 15, 16), L = Jul 29th (trt. 10, 17), L = Jul 30th (cal), L = Jul 31st (trt. 11, 18), M = Aug 6th (trt. 12), N = Aug 10th (trt. 9, 15, 16), N = Aug 12th (trt. 3, 10, 17), N = Aug 13th (cal), N = Aug 14th (trt. 4, 5, 6, 11, 18), O = Aug 20th (trt. 12), P = Aug 24th (trt. 9, 15, 16)
- **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 Code	App Interval	Turf Quality July 29 th	Turf Quality Aug 12 th	Turf Quality Aug 26 th	Turf Quality AUTQC
1	Coho Nontreated Control	NA	NA	5.7bcd	5.7cd	5.7cde	527.3fg
2	Coho Secure Action	BDFHJLN	14 day	7.0a	7.7a	7.0a	597.3a
3	Coho Secure Action	EHN	45%	6.7ab	6.3bc	7.0a	574.0ab
4	Coho Secure Action	EHN	50%	6.0a-d	5.7cd	6.0bcd	539.0d-g
5	Coho Secure Action	HN	55%	6.0a-d	6.0cd	6.7ab	553.0b-f
6	Coho Secure Action	HN	60%	6.3abc	6.0cd	7.0a	564.7bcd
7	Shark Nontreated Control	NA	NA	5.0de	4.7ef	4.3fg	490.0h
8	Shark Secure Action	BDFHJLN	14 day	6.3abc	6.0cd	6.0bcd	557.7b-e
9	Shark Secure Action	EHJLNP	25%	5.3cd	5.3de	5.0ef	518.0g
10	Shark Secure Action	EHJLN	30%	6.0a-d	6.0cd	6.3abc	546.0c-f
11	Shark Secure Action	EHKLN	35%	6.3abc	7.0ab	6.7ab	571.7abc
12	Shark Secure Action	EHMO	40%	5.7bcd	7.0ab	7.0a	564.7bcd
13	Penncross Nontreated Control	NA	NA	4.0e	4.0f	4.0g	441.0i
14	Penncross Secure Action	BDFHJLN	14 day	6.7ab	6.3bc	5.7cde	564.7bc
15	Penncross Secure Action	EGILNP	20%	5.7bcd	5.3de	5.3de	534.3efg
16	Penncross Secure Action	EHJLNP	25%	6.7ab	5.7cd	5.0ef	550.7b-f
17	Penncross Secure Action	EHJLN	30%	6.0a-d	5.7cd	6.0bcd	529.7fg
18	Penncross Secure Action	EHKLN	35%	7.0a	7.0ab	7.0a	574.0ab
NA	NA	NA	LSD P=.05	1.19	0.94	0.74	26.36

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** - B = May 21st (cal), D = Jun 3rd (cal), E = Jun 10th (trt. 9, 10, 15, 16, 17), E = Jun 11th (trt. 3, 4, 11, 12, 18), F = Jun 18th (cal), G = Jun 26th (trt. 15), H = Jun 29th (trt. 9, 16), H = Jun 30th (10, 11, 17, 18), H = Jul 1st (trt. 3, 4, 5, 6, 12, cal), I = Jul 10th (trt. 15), J = Jul 13th (trt. 9, 16), J = Jul 14th (trt. 10, 17), J = Jul 16th (cal), K = Jul 20th (trt. 11, 18), L = Jul 28th (trt. 9, 15, 16), L = Jul 29th (trt. 10, 17), L = Jul 30th (cal), L = Jul 31st (trt. 11, 18), M = Aug 6th (trt. 12), N = Aug 10th (trt. 9, 15, 16), N = Aug 12th (trt. 3, 10, 17), N = Aug 13th (cal), N = Aug 14th (trt. 4, 5, 6, 11, 18), O = Aug 20th (trt. 12), P = Aug 24th (trt. 9, 15, 16)
- **AUTQC** - Area under the turf quality curve (AUTQC) was calculated using the trapezoidal method.