



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

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OBJECTIVE

To evaluate various Smith-Kerns dollar spot model spray thresholds for use on creeping bentgrass 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 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 consistently high in 2025 with the peak disease date being Jul 23. On this date, the non-treated controls for Penncross, Shark, and Coho averaged 118, 120, and 28 dollar spot foci per plot, respectively. The AUDPC for the nontreated plots showed a slight 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. Penncross did not break down even at the highest threshold of 35%, despite 3 less fungicide applications during the summer. Shark also did not break down at the highest threshold of 40%, despite 3 less fungicide applications. Coho did break down at 55% threshold but not 60%. Since the higher threshold of 60% did not break down this could be attributed to natural variation in infection rather than a distinct threshold breakdown. Further research and analysis is needed to refine these thresholds.

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 Code ^b	App Interval	Dollar Spot Severity ^a Jul 23 rd	Dollar Spot Severity Aug 6 th	Dollar Spot Severity Sep 3 rd	Dollar Spot Severity AUDPC ^c
1 Coho Nontreated Control				28.0b	9.7c	2.0c	756.0c
2 Coho Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	0.0d	0.7c	0.0c	42.0f
3 Coho Secure Action	0.5 fl oz/1000 ft ²	GIKN	45%	0.7d	0.0c	11.7c	170.3def
4 Coho Secure Action	0.5 fl oz/1000 ft ²	GJLO	50%	3.3cd	0.7c	0.3c	114.3ef
5 Coho Secure Action	0.5 fl oz/1000 ft ²	HJLO	55%	15.7bc	0.0c	2.7c	438.7c-f
6 Coho Secure Action	0.5 fl oz/1000 ft ²	JMO	60%	0.3d	0.0c	0.0c	191.3def
7 Shark Nontreated Control				120.0a	27.7b	13.0c	3035.7b
8 Shark Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	9.0cd	0.0c	0.0c	196.0def
9 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKMO	25%	0.0d	0.7c	7.7c	95.7ef
10 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKMO	30%	0.0d	0.7c	10.3c	221.7def
11 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKN	35%	0.0d	0.3c	64.7a	634.7cd
12 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKN	40%	0.0d	0.0c	33.0b	268.3def
13 Pennncross Nontreated Control				118.0a	44.0a	1.7c	4113.7a
14 Pennncross Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	7.0cd	0.0c	0.0c	149.3ef
15 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	20%	0.0d	0.0c	50.0ab	368.7c-f
16 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	25%	0.0d	0.0c	2.3c	109.7ef
17 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	30%	0.0d	0.0c	1.0c	39.7f
18 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKN	35%	0.3d	0.3c	67.3a	546.0cde
LSD P=.05				14.77	10.65	19.35	473.33

^aDollar 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).

^bApplication code: D = May 27th, F = Jun 10th, G = Jun 16th (trt. 15), G = Jun 17th (trt. 9, 10, 16, 17), G = Jun 19th (trt. 3, 11, 12, 18), G = Jun 20th (trt. 4), H = Jun 23rd (trt. 5), H = Jun 25th (cal, trt. 6), I = Jun 30th (trt. 15), I = Jul 1st (trt. 9, 10, 16, 17), I = Jul 3rd (trt. 3, 11, 12, 18), J = Jul 7th (trt. 4, 5), J = Jul 9th (cal, trt. 6), K = Jul 14th (trt. 15), K = Jul 15th (trt. 9, 10, 16, 17), K = Jul 17th (trt. 3, 11, 12, 18), L = Jul 21st (trt. 4), L = Jul 24th, L = Jul 25th (trt. 5), M = Jul 28th (trt. 6, 15), M = Jul 29th (trt. 9, 10, 16, 17), N = Aug 6th, N = Aug 8th (trt. 3, 11, 12, 18), O = Aug 11th (trt. 4, 5, 6, 15), O = Aug 13th (trt. 9, 10, 16, 17), P = Aug 20th

^cArea 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	Rate	Application Code ^b	App Interval	Turf Quality ^a	Turf Quality	Turf Quality	Turf Quality
				Jul 23 rd	Aug 6 th	Sep 2 nd	AUTQC ^c
1 Coho Nontreated Control				5.0c	5.7c	6.3bc	507.3d
2 Coho Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	7.0a	7.0a	7.0a	581.0a
3 Coho Secure Action	0.5 fl oz/1000 ft ²	GIKN	45%	7.0a	7.0a	7.0a	581.0a
4 Coho Secure Action	0.5 fl oz/1000 ft ²	GJLO	50%	6.3ab	7.0a	7.0a	571.7ab
5 Coho Secure Action	0.5 fl oz/1000 ft ²	HJLO	55%	5.7bc	7.0a	6.7ab	559.8ab
6 Coho Secure Action	0.5 fl oz/1000 ft ²	JMO	60%	6.7a	6.7ab	6.7ab	560.2ab
7 Shark Nontreated Control				4.0d	4.3d	5.7de	448.0e
8 Shark Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	5.7bc	6.7ab	7.0a	553.3bc
9 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKMO	25%	7.0a	7.0a	7.0a	576.3a
10 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKMO	30%	7.0a	6.7ab	6.7ab	560.2ab
11 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKN	35%	7.0a	6.0bc	5.0f	553.0bc
12 Shark Secure Action	0.5 fl oz/1000 ft ²	GIKN	40%	7.0a	6.3abc	5.3ef	559.8ab
13 Pennncross Nontreated Control				4.0d	4.0d	6.0cd	409.0f
14 Pennncross Secure Action	0.5 fl oz/1000 ft ²	DFHJLNP	14 day	6.7a	6.3abc	7.0a	567.7ab
15 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	20%	7.0a	7.0a	5.0f	566.0ab
16 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	25%	7.0a	6.3abc	7.0a	563.0ab
17 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKMO	30%	7.0a	6.7ab	7.0a	572.0ab
18 Pennncross Secure Action	0.5 fl oz/1000 ft ²	GIKN	35%	6.7a	6.3abc	5.0f	534.0c
LSD P=.05				0.67	0.82	0.57	22.30

^aTurfgrass 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).

^bApplication code: D = May 27th, F = Jun 10th, G = Jun 16th (trt. 15), G = Jun 17th (trt. 9, 10, 16, 17), G = Jun 19th (trt. 3, 11, 12, 18), G = Jun 20th (trt. 4), H = Jun 23rd (trt. 5), H = Jun 25th (cal, trt. 6), I = Jun 30th (trt. 15), I = Jul 1st (trt. 9, 10, 16, 17), I = Jul 3rd (trt. 3, 11, 12, 18), J = Jul 7th (trt. 4,5), J = Jul 9th (cal, trt. 6), K = Jul 14th (trt. 15), K = Jul 15th (trt. 9, 10, 16, 17), K = Jul 17th (trt. 3, 11, 12, 18), L = Jul 21st (trt. 4), L = Jul 24th, L = Jul 25th (trt. 5), M = Jul 28th (trt. 6, 15), M = Jul 29th (trt. 9,10, 16, 17), N = Aug 6th, N = Aug 8th (trt. 3, 11, 12, 18), O = Aug 11th (trt. 4, 5, 6, 15), O = Aug 13th (trt. 9, 10, 16, 17), P = Aug 20th

^cArea under the turf quality curve (AUTQC) was calculated using the trapezoidal method.