Smith-Kerns Dollar Spot Model - Upper Limit

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OBJECTIVE

To determine whether tighter spray intervals are required when an upper limit is reached on the Smith-Kerns dollar spot prediction model.

MATERIALS AND METHODS

The study was conducted at the O. J. Noer Turfgrass Research and Education Facility in Madison, WI on a stand of 'Penncross' creeping bentgrass (*Agrostis stolonifera*) maintained at 0.5 inches. The individual plots measured 3 feet by 10 feet and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i. using a CO_2 -pressurized boom sprayer equipped with two XR Teejet AI8004 nozzles. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft^2. Treatments 2 and 3 were initiated on May 27th, 2020 and subsequent applications were made at 28- or 21-day intervals, respectively. Treatments 4-8 were also initiated on May 27th, 2020 and were applied using the Smith-Kerns model at a 28-day interval when the model was 20% or higher. When the model reached 30%, 40%, 50%, or 60%, treatments 5, 6, 7, and 8 switched to a 21-day interval, respectively. 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. Disease severity and turf quality 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.

RESULTS AND DISCUSSION

Dollar spot developed in the experimental area during July and remained steady for the rest of the study. All fungicide treatments reduced dollar spot severity significantly when compared to the non-treated control. Despite intricate variations in when these fungicide treatments were applied, relatively minor differences were observed between treatments. However, a significant jump in disease was observed using the 60% cutoff, indicating that tightening intervals once the model surpasses 50% may be an effective control strategy. Further research is needed to discern whether tighter intervals are required when certain upper limits are met on the Smith-Kerns dollar spot prediction model.

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 2020.

	Treatment	Rate	Application Code[b]	App Rule	Dollar Spot Severity[a]		
					Jul 22	Aug 5	Sep 16
1	Non-treated control				71.3a	171.5a	125.5a
2	Banner Maxx	2.0 FL OZ/1000 FT2	BFJNR	28 day	30.0a	6.0b	17.3c
3	Banner Maxx	2.0 FL OZ/1000 FT2	BEHKNQ	21 day	7.8cd	29.8b	2.0d
4	Banner Maxx	2.0 FL OZ/1000 FT2	BFJNR	28 d-20%	34.0b	5.5b	21.8c
5	Banner Maxx	2.0 FL OZ/1000 FT2	BFILOR	28 d-20% 21 d-30%	2.3d	14.3b	4.3d
6	Banner Maxx	2.0 FL OZ/1000 FT2	BFIMP	28 d-20% 21 d-40%	1.3d	16.3b	4.0d
7	Banner Maxx	2.0 FL OZ/1000 FT2	BFIMQ	28 d-20% 21 d-50%	8.8cd	1.3b	5.8d
8	Banner Maxx	2.0 FL OZ/1000 FT2	BFJMR	28 d-20% 21 d-60%	22.0bc	5.0b	37.0b
				LSD P=.05	18.37	47.7	11.11

[a]Dollar 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).

[b]Application code B=May 27, E=Jun 16, F(trt 5)=Jun 22, F(trt 6)=Jun 23, F(trt 2, 4, 7, 8)=Jun 24, H=Jul 7, I(trt 5)=Jul 13, I(trt 6)=Jul 14, I(trt 7)=Jul 16, J(trt 8)=Jul 20, J(trt 2, 4)=Jul 22, K=Jul 28, L=Aug 3, M(trt 6, 7)=Aug 10, M(trt 8)=Aug 11, N=Aug 18, O=Aug 24, P = Aug 31, Q(trt 7)=Sep 7, Q(trt 3)=Sep 11, R = Sep 14

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 2020.

	Treatment	Rate	Application Code[b]	App Rule	Turfgrass Quality[a]		
					Jul 22	Aug 5	Sep 16
1	Non-treated control				4.3d	4.3d	4.3c
2	Banner Maxx	2.0 FL OZ/1000 FT2	BFJNR	28 day	5.5c	6.3ab	6.0b
3	Banner Maxx	2.0 FL OZ/1000 FT2	BEHKNQ	21 day	5.5c	5.3c	7.0a
4	Banner Maxx	2.0 FL OZ/1000 FT2	BFJNR	28 d-20%	5.0cd	6.3ab	5.8b
5	Banner Maxx	2.0 FL OZ/1000 FT2	BFILOR	28 d-20% 21 d-30%	6.5ab	5.8bc	6.8a
6	Banner Maxx	2.0 FL OZ/1000 FT2	BFIMP	28 d-20% 21 d-40%	6.8a	5.8bc	7.0a
7	Banner Maxx	2.0 FL OZ/1000 FT2	BFIMQ	28 d-20% 21 d-50%	5.8bc	6.5a	7.0a
8	Banner Maxx	2.0 FL OZ/1000 FT2	BFJMR	28 d-20% 21 d-60%	5.3c	5.8bc	5.5b
				LSD P=.05	0.81	0.55	0.52

[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 B=May 27, E=Jun 16, F(trt 5)=Jun 22, F(trt 6)=Jun 23, F(trt 2, 4, 7, 8)=Jun 24, H=Jul 7, I(trt 5)=Jul 13, I(trt 6)=Jul 14, I(trt 7)=Jul 16, J(trt 8)=Jul 20, J(trt 2, 4)=Jul 22, K=Jul 28, L=Aug 3, M(trt 6, 7)=Aug 10, M(trt 8)=Aug 11, N=Aug 18, O=Aug 24, P = Aug 31, Q(trt 7)=Sep 7, Q(trt 3)=Sep 11, R = Sep 14