Dollar Spot Model Upper Limit

Reid Melton, Kurt Hockemeyer, Connor Cruz, Paul Koch, Ph.D.
Department of Plant Pathology
University of Wisconsin - Madison

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 on a stand of 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 23, 2019 and subsequent applications were made at 21- or 17-day intervals, respectively. Treatments 4-8 were initiated on May 29, 2019 and were applied using the Smith-Kerns model at a 21-day interval when the model is 20% or higher. When the model reached 30%, 40%, 50%, or 60%, treatments 5, 6, 7, and 8 switched to a 17-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 50% cutoff under very high pressure on Sep 18, indicating that tightening intervals once the model surpasses 40% 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 2019.

	Treatment	Rate	Application Code[b]	App Rule	Dollar Spot Severity[a]		
					Jul 10	Aug 21	Sep 18
1	Non-treated control				28.0a	185.0a	135.5a
2	Banner Maxx	2.0 fl oz/M	BEHKNQT	21 day	0.5b	0.0c	10.5bc
3	Banner Maxx	2.0 fl oz/M	BEGJLOQT	17 day	1.3b	16.8b	2.3c
4	Banner Maxx	2.0 fl oz/M	CFILOR	21 d-20%	1.8b	11.3bc	0.0c
5	Banner Maxx	2.0 fl oz/M	CFHKMPS	21 d-20% 17 d-30%	0.0b	0.0c	2.5c
6	Banner Maxx	2.0 fl oz/M	CFHKMPS	21 d-20% 17 d-40%	0.0b	0.0c	2.8c
7	Banner Maxx	2.0 fl oz/M	CFHKNQS	21 d-20% 17 d-50%	0.0b	0.0c	15.0b
8	Banner Maxx	2.0 fl oz/M	CFHKNQT	21 d-20% 17 d-60%	0.0b	0.0c	3.8bc
				LSD P=.05	3.62	11.83	11.3

[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 23, C=May 29, E=June 10 (trt 3), E=June 14 (trt 2), F=June 19, G=June 27, H=July 3 (trt 2), H=July 5 (trt 5-8), I=July 10, J=July 15, K=July 22 (trt 5-8), K=July 24 (trt 2), L=July 31 (trt 4), L=Aug 1 (trt 3), M=Aug 8, N=Aug 12 (trt 7-8), N=Aug 14 (trt 2), O=Aug 19 (trt 3), O=Aug 21 (trt 4), P=Aug 29, Q=Sep 3 (trt 7-8), Q=Sep 4 (trt 2), Q=Sep 5 (trt 3), R=Sep 11, S=Sep 16 (trt 5), S=Sep 18 (trt 6), S=Sep 19 (trt 7), T=Sep 24

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 2019.

	Treatment	Rate	Application Code[b]	App Rule	Turfgrass Quality[a]		
					Jul 10	Aug 21	Sep 18
1	Non-treated control				5.0b	4.3d	5.0b
2	Banner Maxx	2.0 fl oz/M	BEHKNQT	21 day	7.0a	7.0a	6.5a
3	Banner Maxx	2.0 fl oz/M	BEGJLOQT	17 day	6.8a	5.8c	7.0a
4	Banner Maxx	2.0 fl oz/M	CFILOR	21 d-20%	6.8a	6.3bc	7.0a
5	Banner Maxx	2.0 fl oz/M	CFHKMPS	21 d-20% 17 d-30%	7.0a	7.0a	7.0a
6	Banner Maxx	2.0 fl oz/M	CFHKMPS	21 d-20% 17 d-40%	7.0a	6.8ab	7.0a
7	Banner Maxx	2.0 fl oz/M	CFHKNQS	21 d-20% 17 d-50%	7.0a	7.0a	6.5a
8	Banner Maxx	2.0 fl oz/M	CFHKNQT	21 d-20% 17 d-60%	7.0a	7.0a	6.8a
				LSD P=.05	0.34	0.53	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 23, C=May 29, E=June 10 (trt 3), E=June 14 (trt 2), F=June 19, G=June 27, H=July 3 (trt 2), H=July 5 (trt 5-8), I=July 10, J=July 15, K=July 22 (trt 5-8), K=July 24 (trt 2), L=July 31 (trt 4), L=Aug 1 (trt 3), M=Aug 8, N=Aug 12 (trt 7-8), N=Aug 14 (trt 2), O=Aug 19 (trt 3), O=Aug 21 (trt 4), P=Aug 29, Q=Sep 3 (trt 7-8), Q=Sep 4 (trt 2), Q=Sep 5 (trt 3), R=Sep 11, S=Sep 16 (trt 5), S=Sep 18 (trt 6), S=Sep 19 (trt 7), T=Sep 24