Reduced-Risk Dollar Spot Control

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

OBJECTIVE

To evaluate different fungicide programs based off of the statewide average pesticide impact using the Hazard Quotient model.

MATERIALS AND METHODS

The study was conducted at the O.J. Noer Turfgrass Research and Education Facility in Madison, WI. The study was conducted on creeping bentgrass (*Agrostis stolonifera* 'Pencross') maintained at a 0.5 inch cutting height. The individual plots measured 6 ft X 10 ft 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 2 XR Teejet AI8004 VS nozzles. All fungicides were agitated by hand and applied in the equivalent of 1.5 gallons of water per 1000 ft^2. Four fungicide programs were tested in addition to the non-treated control. One was 100% of the statewide pesticide impact (using Hazard Quotient to measure impact) average based on 16 courses around the state that volunteered their pesticide records. The others were 75%, 50%, and 25% of the statewide average. Number of dollar spot infection centers per plot and turfgrass quality (1-9, 9 being excellent, 6 acceptable, and 1 bare soil) were assessed every two weeks. Results were subjected to an analysis of variance and means were separated using Fisher's LSD (P = 0.05). Disease severity and turfgrass quality can be found in the following tables.

RESULTS AND DISCUSSION

Dollar spot pressure first became severe in early July. All fungicide programs performed similarly, reducing dollar spot severity significantly when compared to the non-treated controls. All fungicide programs provded acceptable turf quality throughout the summer as well. This study shows that the hazard quotient of a fungicide program can be significantly reduced without a reduction in dollar spot control or turf quality.

Table 1. Hazard quotient and cost of all four fungicide programs.

Program	**Hazard Quotient**	**Cost/Acre**	**Cost/30 Acres**
100%	28,650	$1,750	$52,000
75%	21,820	$1,600	$48,000
50%	13,784	$1,300	$39,000
25%	6,465	$1,300	$39,000

Table 1. Mean number of dollar spot infection centers per treatment at the OJ Noer Turfgrass Research and Education Facility in Madison, WI in 2020.

		Treatment	Rate	Application Date	Dollar spot severity[a]		
					Jul 8	Aug 5	Sep 2
1		Non-treated control			114.3a	123.3a	509.0a
2	25 % of State average	Xzemplar	0.26 fl oz/1000 ft2	May 29	1.3b	0.0b	2.3b
		Banner Maxx	2.0 fl oz/1000 ft2	Jun 17			
		Velista	0.5 oz/1000 ft2	Jul 1			
		Secure	0.5 fl oz/1000 ft2	Jul 16			
		Secure	0.5 fl oz/1000 ft2	Jul 30			
		Xzemplar	0.26 fl oz/1000 ft2	Aug 13			
		Emerald	0.18 oz/1000 ft2	Sep 11			
		Banner Maxx	2.0 fl oz/1000 ft2	Oct 8			
		Secure	0.5 fl oz/1000 ft2	Nov 15			
		Torque	0.6 fl oz/1000 ft2	Nov 15			
3	50 % of State average	Xzemplar	0.26 fl oz/1000 ft2	May 29	2.5b	2.0b	0.8b
		Secure	0.5 fl oz/1000 ft2	Jun 11			
		Secure	0.5 fl oz/1000 ft2	Jul 1			
		Secure	0.5 fl oz/1000 ft2	Jul 16			
		Secure	0.5 fl oz/1000 ft2	Jul 30			
		Banner Maxx	1.0 fl oz/1000 ft2	Aug 13			
		Xzemplar	0.26 fl oz/1000 ft2	Aug 27			
		Daconil Ultrex	3.6 oz/1000 ft2	Aug 27			
		Banner Maxx	2.0 fl oz/1000 ft2	Sep 24			
		Daconil Ultrex	5.0 oz/1000 ft2	Sep 24			
		Daconil Ultrex	5.0 oz/1000 ft2	Nov 15			
		Torque	0.6 fl oz/1000 ft2	Nov 15			
4	75 % of State average	Secure	0.5 fl oz/1000 ft2	May 29	2.3b	46.3b	3.0b
		Xzemplar	0.26 fl oz/1000 ft2	Jun 17			
		Banner Maxx	1.0 fl oz/1000 ft2	Jul 9			
		Heritage TL	1.0 fl oz/1000 ft2	Jul 9			
		Xzemplar	0.26 fl oz/1000 ft2	Jul 30			
		Daconil Action	3.0 fl oz/1000 ft2	Aug 20			
		Concert II	3.0 fl oz/1000 ft2	Sep 4			
		26 GT	2.0 fl oz/1000 ft2	Oct 1			
		Banner Maxx	2.0 fl oz/1000 ft2	Oct 22			
		Instrata	9.0 fl oz/1000 ft2	Nov 15			
5	100 % of State average	Banner Maxx	2.0 fl oz/1000 ft2	May 29	9.3b	33.3b	3.3b
		Banner Maxx	1.0 fl oz/1000 ft2	Jun 4			
		26 GT	4.0 fl oz/1000 ft2	Jun 17			
		Renown	3.53 fl oz/1000 ft2	Jul 9			
		Daconil Weatherstik	3.6 fl oz/1000 ft2	Jul 23			
		Banner Maxx	1.0 fl oz/1000 ft2	Aug 6			
		26 GT	4.0 fl oz/1000 ft2	Aug 20			
		Heritage TL	1.0 fl oz/1000 ft2	Aug 20			
		Torque	0.6 fl oz/1000 ft2	Sep 4			
		Emerald	0.15 oz/1000 ft2	Sep 24			
		Instrata	7.0 fl oz/1000 ft2	Nov 15			
				LSD (P=.05)	20.5	46.74	97.78

[a]Dollar spot was visually assessed as number of dollar spot infection centers per plot. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).

Table 2. Mean turf quality ratings per treatment at the OJ Noer Turfgrass Research and Education Facility in Madison, WI in 2020.

	Treatment	Rate	Application Date	Turfgrass Quality[a]		
				Jul 8	Aug 5	Sep 2
1	Non-treated control			4.8c	4.8c	4.0b
2	25 % of State average			7.0a	7.0a	6.8a
	Xzemplar	0.26 fl oz/1000 ft2	May 29			
	Banner Maxx	2.0 fl oz/1000 ft2	Jun 17			
	Velista	0.5 oz/1000 ft2	Jul 1			
	Secure	0.5 fl oz/1000 ft2	Jul 16			
	Secure	0.5 fl oz/1000 ft2	Jul 30			
	Xzemplar	0.26 fl oz/1000 ft2	Aug 13			
	Emerald	0.18 oz/1000 ft2	Sep 11			
	Banner Maxx	2.0 fl oz/1000 ft2	Oct 8			
	Secure	0.5 fl oz/1000 ft2	Nov 15			
	Torque	0.6 fl oz/1000 ft2	Nov 15			
3	50 % of State average			7.0a	7.0a	7.0a
	Xzemplar	0.26 fl oz/1000 ft2	May 29			
	Secure	0.5 fl oz/1000 ft2	Jun 11			
	Secure	0.5 fl oz/1000 ft2	Jul 1			
	Secure	0.5 fl oz/1000 ft2	Jul 16			
	Secure	0.5 fl oz/1000 ft2	Jul 30			
	Banner Maxx	1.0 fl oz/1000 ft2	Aug 13			
	Xzemplar	0.26 fl oz/1000 ft2	Aug 27			
	Daconil Ultrex	3.6 oz/1000 ft2	Aug 27			
	Banner Maxx	2.0 fl oz/1000 ft2	Sep 24			
	Daconil Ultrex	5.0 oz/1000 ft2	Sep 24			
	Daconil Ultrex	5.0 oz/1000 ft2	Nov 15			
	Torque	0.6 fl oz/1000 ft2	Nov 15			
4	75 % of State average			7.0a	5.8b	6.8a
	Secure	0.5 fl oz/1000 ft2	May 29			
	Xzemplar	0.26 fl oz/1000 ft2	Jun 17			
	Banner Maxx	1.0 fl oz/1000 ft2	Jul 9			
	Heritage TL	1.0 fl oz/1000 ft2	Jul 9			
	Xzemplar	0.26 fl oz/1000 ft2	Jul 30			
	Daconil Action	3.0 fl oz/1000 ft2	Aug 20			
	Concert II	3.0 fl oz/1000 ft2	Sep 4			
	26 GT	2.0 fl oz/1000 ft2	Oct 1			
	Banner Maxx	2.0 fl oz/1000 ft2	Oct 22			
	Instrata	9.0 fl oz/1000 ft2	Nov 15			
5	100 % of State average			6.3b	6.0b	7.0a
	Banner Maxx	2.0 fl oz/1000 ft2	May 29			
	Banner Maxx	1.0 fl oz/1000 ft2	Jun 4			
	26 GT	4.0 fl oz/1000 ft2	Jun 17			
	Renown	3.53 fl oz/1000 ft2	Jul 9			
	Daconil Weatherstik	3.6 fl oz/1000 ft2	Jul 23			
	Banner Maxx	1.0 fl oz/1000 ft2	Aug 6			
	26 GT	4.0 fl oz/1000 ft2	Aug 20			
	Heritage TL	1.0 fl oz/1000 ft2	Aug 20			
	Torque	0.6 fl oz/1000 ft2	Sep 4			
	Emerald	0.15 oz/1000 ft2	Sep 24			
	Instrata	7.0 fl oz/1000 ft2	Nov 15			
			LSD (P=.05)	0.54	0.7	0.51

[a]Turfgrass quality was visually assessed on 1-9 scale, with 9 being excellent, 6 being acceptable, and 1 bare dirt. Means followed by the same letter do not significantly differ (P=.05, Fisher's LSD).