

Evaluation of Fungicide Efficacy on Creeping Bentgrass

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Introduction

Ten fungicide treatments were evaluated during 2011 for control of dollar spot and brown spot in green height creeping bentgrass at two locations: the ISU Horticulture Research Station, Ames, Iowa, and a practice green at ISU's Veenker Golf Course in Ames.

Materials and Methods

Plots of creeping bentgrass (cv. Emerald and A4) were maintained at 0.16-in. cutting height at the Horticulture Station and Veenker Golf Course, respectively. The experimental design was a randomized complete block with four replications. All sub-plots measured 4 ft × 5 ft. Spray applications were initiated on May 20, and re-applications were made at prescribed intervals (Table 1) until August 12. On June 6, plots at the Hort Station were inoculated with rye grain infested with *Sclerotinia homoeocarpa*, the fungus that causes dollar spot.

Assessments of disease symptoms were made on June 28, July 14, July 28, August 4, and August 16. Visual estimates of brown patch severity were made with a qualitative scale of 0–5, where 0 = no disease; 1 = 1–5 percent; 2 = 6–10 percent; 3 = 11–25 percent; 4 = 26–50 percent; 5 = >50 percent plot symptomatic. Dollar spot was rated as percent of the plot that displayed symptoms. A turf quality assessment was made using a

qualitative scale (1 = poorest, 9 = best, 6 = acceptable). Data were analyzed using the GLM procedure in SAS, and mean separations were determined using Fisher's protected LSD at $P \leq 0.05$.

Results and Discussion

Weather in central Iowa during May and June was cool and wet. July had record heat, and August was slightly cooler than normal. Both months were relatively dry.

Brown patch pressure was moderate to severe at the Hort Station, but light to moderate at Veenker Golf Course. There were significant differences among treatments in ability to suppress brown patch, and most but not all of the tested products suppressed brown patch significantly ($P \leq 0.05$) in comparison to the unsprayed check (Table 1).

Dollar spot pressure was light to moderate at the Hort Station, and dollar spot was nearly absent at Veenker Golf Course (Table 2). Almost all treatments provided significant dollar spot suppression at the Hort Station on all rating dates.

Turf quality in the untreated control declined progressively across the rating dates at the Hort Station, but the decline over time was much less pronounced at Veenker (Table 3). At the Hort Station, several treatments showed stable or even improved quality over the summer, despite record heat from July 10–31. No conspicuous phytotoxicity symptoms were observed during the trial.

Acknowledgements

We thank Marcus Jones and his crew at the ISU Horticulture Research Station and John Newton and his crew at Veenker Memorial Golf Course, for maintenance of turf.

Table 1. Brown patch severity^x on greens at the ISU Horticulture Research Station and Veenker Golf Course, summer 2011.

Trt	Products and rates per 1,000 sq ft	Interval (days)	Horticulture Research Station				Veenker Golf Course		
			Jul 14 ^y	Jul 28	Aug 4	Aug 16	Jul 14	Jul 28	Aug 4
1	Unsprayed check.....		0.0 b	2.8 a	3.8 a	4.5 a	2.0 a-c	1.8 a	1.3 a-c
2	Bayer Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz.....	14	0.0 b	0.0 b	0.0 d	0.0 d	0.3 bc	0.0 a	0.3 bc
	2 nd spray Chipco Signature 80WG 4.0 oz + Triton Flo 367 SC 0.5 fl oz	14							
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex83 WG 3.2 oz	14							
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14							
	5 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14							
	6 th spray Chipco Signature 80WG 4.0 oz + Chipco 26 GT 240 SC 4.0 oz	14							
	7 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14							
3	Bayer Bayleton FLO 500 SC 1.5 oz.....	21	0.0 b	2.0 ab	0.0 d	1.0 cd	3.0 a	1.8 a	2.3 a
4	Bayer Bayleton FLO 500 SC 1.0 oz.....	21	0.0 b	1.3 ab	1.3 cd	1.3 cd	2.0 a-c	0.3 a	1.0 a-c
5	Bayer Chipco Signature 80WG 4.0 oz + Tartan 288 SC 1.5 fl oz.....	14	0.0 b	0.0 b	0.0 d	0.0 d	0.0 c	0.0 a	0.0 c
	2 nd spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14							
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14							
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14							
	5 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14							
	6 th spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14							
	7 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14							
6	Pillar 81 G (673 00F) 3 lb.....	28	0.0 b	0.0 b	0.3 d	0.0 d	1.3 abc	1.0 a	0.3 bc
7	Pillar 81 G (673 03F) 3 lb.....	28	0.0 b	0.0 b	0.0 d	0.3 d	2.5 a	1.8 a	2.0 ab
8	Pillar 81 G (673 03F) 3 lb.....	14	0.0 b	0.0 b	0.0 d	0.0 d	1.3 a-c	0.5 a	0.8 a-c
9	Heritage 31 G 3 lb.....	28	0.0 b	1.3 ab	3.0 ab	3.8 ab	1.50 a-c	0.5 a	0.3 bc
10	Heritage 31 G 3 lb.....	14	0.3 a	0.8 ab	2.0 bc	2.5 bc	2.3 ab	0.0 a	0.5 a-c
	LSD (0.05) ^y		0.23	2.12	1.42	1.88	2.01	2.01	1.95

^xDisease rating scale 0 = no disease; 1 = 1–5%; 2 = 6–10%; 3 = 11–25%; 4 = 26–50%; 5 = >50% plot symptomatic.

^yMeans followed by the same letter are not significantly different within column according to Fisher's protected LSD at P<0.05.

Table 2. Percent dollar spot on greens at the ISU Horticulture Research Station and Veenker Golf Course, summer 2011.

Trt	Products and rates per 1,000 sq ft	Interval (days)	Horticulture Research Station					Veenker Golf Course			
			Jun 28	Jul 14	Jul 28	Aug 4	Aug 16	Jun 28	Jul 14	Jul 28	Aug 4
1	Unsprayed check.....		23 a ^y	6.8 a	10.0 a	11.3 a	11.5 a	0.0 b	0.5 a	1.0 a	0.0 a
2	Bayer Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz....	14	0.8 ab	1.3 d	4.3 bc	2.0 cd	0.00 c	0.0 b	0.0 b	0.0 b	0.0 a
	2 nd spray Chipco Signature 80WG 4.0 oz + Triton Flo 367 SC 0.5 fl oz	14									
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex83 WG 3.2 oz	14									
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	5 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14									
	6 th spray Chipco Signature 80WG 4.0 oz + Chipco 26 GT 240 SC 4.0 oz	14									
	7 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
3	Bayer Bayleton FLO 500 SC 1.5 oz.....	21	0.3 b	0.5 d	0.3 d	0.3 d	0.25 c	0.1 a	0.0 b	0.0 b	0.0 a
4	Bayer Bayleton FLO 500 SC 1.0 oz.....	21	0.5 b	0.8 d	0.5 d	0.3 d	1.50 c	0.0 b	0.0 b	0.0 b	0.0 a
5	Bayer Chipco Signature 80WG 4.0 oz + Tartan 288 SC 1.5 fl oz.....	14	0.1 b	0.5 d	0.8 d	0.3 d	0.25 c	0.0 b	0.0 b	0.0 b	0.0 a
	2 nd spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14									
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14									
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	5 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	6 th spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14									
	7 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14									
6	Pillar 81 G (673 00F) 3 lb.....	28	0.1 b	1.8 cd	1.8 cd	2.8 cd	1.75 c	0.0 b	0.0 b	0.0 b	0.0 a
7	Pillar 81 G (673 03F) 3 lb.....	28	0.1 b	2.3 cd	3.0 b-d	3.3 b-d	3.25 bc	0.0 b	0.0 b	0.0 b	0.0 a
8	Pillar 81 G (673 03F) 3 lb.....	14	0.3 b	1.3 d	1.3 d	1.3 d	0.75 c	0.0 b	0.0 b	0.0 b	0.0 a
9	Heritage 31 G 3 lb.....	28	1.8 ab	5.0 ab	5.8 b	6.8 b	6.50 b	0.0 b	0.0 b	0.8 a	0.0 a
10	Heritage 31 G 3 lb.....	14	1.0 ab	3.8 bc	4.5 bc	5.3 bc	5.50 b	0.0 b	0.0 b	0.5 ab	0.0 a
	LSD (0.05) ^y		1.65	2.22	2.96	3.51	3.34	0.11	0.46	0.73	0

^yMeans followed by the same letter are not significantly different within column according to Fisher's protected LSD at P<0.05.

Table 3. Turf quality rating^x on greens at the ISU Horticulture Research Station and Veenker Golf Course, summer 2011.

Tr t	Products and rates per 1,000 sq ft	Interval (days)	Horticulture Research Station					Veenker Golf Course			
			Jun 28	Jul 14	Jul 28	Aug 4	Aug 16	Jun 28	Jul 14	Jul 28	Aug 4
1	Unsprayed check.....		6.8b ^z	6.0 e	5.0 e	4.8 f	3.5 g	7.0 ab	5.5 abc	6.5 a-c	6.5 ab
2	Bayer Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz.	14	7.0 ab	8.3 ab	7.0 ab	7.8 ab	8.8 a	7.3 ab	6.8 a	7.5 a	6.8 ab
	2 nd spray Chipco Signature 80WG 4.0 oz + Triton Flo 367 SC 0.5 fl oz	14									
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex83 WG 3.2 oz	14									
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	5 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14									
	6 th spray Chipco Signature 80WG 4.0 oz + Chipco 26 GT 240 SC 4.0 oz	14									
	7 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
3	Bayer Bayleton FLO 500 SC 1.5 oz.....	21	6.8 b	7.0 cd	6.0 cd	6.5 cd	5.8 ef	6.5 b	4.5 c	6.0 c	5.8 b
4	Bayer Bayleton FLO 500 SC 1.0 oz.....	21	7.0 ab	7.5 bc	6.0 cd	6.3 de	5.8 ef	6.8 ab	5.3 bc	6.8 a-c	6.3 ab
5	Bayer Chipco Signature 80WG 4.0 oz + Tartan 288 SC 1.5 fl oz.....	14	7.3 ab	8.5 a	7.5 a	8.5 a	8.5 ab	7.5 a	6.8 a	7.0 a-c	7.3 a
	2 nd spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14									
	3 rd spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG 3.2 oz	14									
	4 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	5 th spray Chipco Signature 80WG 4.0 oz + Reserve 4.8 SC 3.6 fl oz	14									
	6 th spray Chipco Signature 80WG 4.0 oz + Interface 25 SC 5 fl oz	14									
	7 th spray Chipco Signature 80WG 4.0 oz + Daconil Ultrex 83 WG .2 oz	14									
6	Pillar 81 G (673 00F) 3 lb.....	28	7.0 ab	7.3 cd	6.8 a-c	6.8 b-d	7.3 cd	7.0 ab	5.5 a-c	7.0 a-c	6.3 ab
7	Pillar 81 G (673 03F) 3 lb.....	28	7.0 ab	7.3 cd	6.8 a-c	7.0 b-d	6.3 de	6.8 ab	5.5 abc	6.3 bc	6.5 ab
8	Pillar 81 G (673 03F) 3 lb.....	14	7.5 a	7.5 bc	7.3 a	7.5 a-c	7.5 bc	7.0 ab	6.0 ab	7.3 ab	6.5 ab
9	Heritage 31 G 3 lb.....	28	7.0 ab	6.5 de	5.8 de	5.3 ef	4.8 f	7.0 ab	5.5 a-c	6.8 a-c	6.8 ab
10	Heritage 31 G 3 lb.....	14	6.8 b	6.5 de	6.3 b-d	6.0 de	5.3 ef	6.5 b	5.3 bc	7.0 a-c	6.5 ab
	LSD (0.05) ^z		0.51	0.87	0.9	1.21	1.22	0.84	1.28	1.22	1.38

^xA turf quality assessment of 1 to 10 (1 = poorest, 10 = best, 6 = acceptable).

^zMeans followed by the same letter are not significantly different within column according to Fisher's protected LSD at P<0.05.