

CREEPING BENTGRASS (*Agrostis palustris* 'A-1')

Visual quality

Brown patch; *Rhizoctonia solani*

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Evaluation of fungicides for maintenance of summer quality in creeping bentgrass, 2003.

Fungicides were evaluated for their effect on visual quality and disease development in creeping bentgrass. This trial was conducted at the North Carolina State University Turfgrass Field Lab in Raleigh, NC on 'A1' creeping bentgrass maintained under golf course putting green conditions. Mowing was performed three times weekly at a height of 0.156 in. with clippings collected, and the site was irrigated to prevent drought stress. Fertilizer was applied as 24-5-11 on 9 Apr (0.5 lb N/1000 sq ft), 18-3-18 on 5 May (0.5 lb N/1000 sq ft), 18-4-10 on 15 May (0.5 lbN/1000 sq ft), and 25-5-15 on 17 Sep (1 lb N/1000 sq ft). Insect pests were suppressed with Dursban Pro (1.5 oz/1000 sq ft) on 16 May, 27 Jun, and 25 Jul. Canteen wetting agent (6 fl oz/1000 sq ft) was applied on 24 Apr, 12 May, 24 Jun, and 1 Aug for suppression of localized dry spots. Plots were 3.33 ft x 5 ft and were arranged in a randomized complete block with four replications. Fungicides were applied in water equivalent to 2 gal per 1000 sq ft with a CO₂ powered sprayer at 40 psi using TeeJet 8004 nozzles. All treatments were initiated on 3 Jun. Fungicides were reapplied at the appropriate intervals as indicated in the table. Turfgrass quality was evaluated on 17 Jun, 30 Jun, 14 Jul, 28 Jul, 27 Aug, 9 Sep, 19 Sep, and 7 Oct, using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Percent turf area exhibiting brown patch symptoms was assessed on 16 Jul. Data were subjected to analysis of variance and means separation by Waller-Duncan k-ratio t test (k=100).

Turfgrass quality was poor in untreated plots throughout this trial due to unusually wet, overcast weather conditions, resulting in low turf vigor and severe pressure from algae and brown patch. No fungicide treatments consistently increased turfgrass quality in June and July compared to the Untreated Control. Signature Programs 8, 9, and 10 did not initially improve turfgrass quality, likely due to applications of Bayleton and Chipco 26GT, which do not suppress algae invasion and are not highly effective for brown patch control. Vital Programs 6 and 7 produced numerically higher turf quality on 30 Jun and 28 Jul than on 14 Jul, indicating that Vital + Concord applications were more beneficial than applications of Vital + Junction or GX-734G + Junction. The tank-mixture of Alude + Spectro produced significantly higher turf quality than Spectro alone on 17 Jun and 14 Jul.

During August, September, and October, the highest turf quality was consistently produced by Signature Program 10, which contained applications of Signature + Heritage (31 Jul), Signature + Prostar (13 Aug), Signature + Heritage (27 Aug), Signature + Daconil Ultrex (10 Sep), and Signature + Chipco 26GT (24 Sep). Applications of Alude + Spectro resulted in significantly higher turfgrass quality compared to the Untreated Control or Spectro alone throughout August, September, and October.

Brown patch development was observed in the experimental area throughout this trial, however, distinct patches were not typically observed, making evaluation of disease incidence difficult. Distinct circular patches with "smoke rings" were observed in the trial on 16 Jul, allowing accurate measurement of brown patch incidence. All treatments except Alude + Protect, Vital Program 6, and Vital Program 7 resulted in excellent control of brown patch on this date.

Table 1. Effect of fungicide treatments on visual quality of ‘A-1’ creeping bentgrass in Raleigh, NC.

Treatment and rate / 1000 sq ft	Application code	Turf quality ^z				
		17 Jun	30 Jun	14 Jul	28 Jul	27 Aug
1. Alude SC 5.5 fl oz.....	A-I ^y	3.8 bcd ^x	3.8 b	3.5 d	5.0 a	5.0 cde
Endorse 2.5WP 4.0 oz.....	A-I					
2. Alude SC 5.5 fl oz.....	A-I	6.0 a	6.5 a	5.5 a	4.0 a	4.0 e
Protect 80WP 8.0 oz.....	A-I					
3. Alude SC 5.5 fl oz.....	A-I	4.8 b	6.3 a	5.0 ab	5.5 a	6.8 ab
Spectro 90WDG 4.0 oz.....	A-I					
4. Spectro 90WDG 4.0 oz.....	A-I	3.0 def	5.0 ab	3.5 d	4.0 a	4.8 cde
5. Consyst 67WDG 4.0 oz.....	A-I	3.0 def	4.8 ab	3.8 cd	4.3 a	4.5 de
6. Vital 4L 6.0 fl oz.....	CEGI	2.5 ef	6.0 ab	4.3 bcd	6.0 a	6.8 ab
Junction 60DF 2.0 oz.....	CEGI					
Vital 4L 6.0 fl oz.....	BDFH					
Concord 82.5WDG 3.2 oz.....	BDFH					
7. GX-734G 6.0 fl oz.....	CEGI	2.0 f	5.3 ab	4.8 abc	5.5 a	5.0 cde
Junction 60DF 1.0 oz.....	CEGI					
Vital 4L 6.0 fl oz.....	BDFH					
Concord 82.5WDG 3.2 oz.....	BDFH					
8. Signature 80WDG 4.0 oz.....	A-I	3.5 cde	5.3 ab	3.5 d	5.8 a	6.3 abc
Bayleton 50DF 1.0 oz.....	A					
26GT 2SC 4.0 fl oz.....	B					
Compass 50WG 0.25 oz.....	C					
Daconil Ultrex 82.5WDG 3.2 oz.....	D					
Daconil Ultrex 82.5 WDG 3.2 oz.....	E					
Compass 50WG 0.25 oz.....	F					
Spectro 90WDG 4.0 oz.....	G					
26GT 2SC 4.0 fl oz.....	H					
26GT 2SC 4.0 fl oz.....	I					
9. Signature 80WDG 4.0 oz.....	A-I	3.8 bcd	5.3 ab	3.5 d	4.3 a	6.0 bcd
26GT 2SC 4.0 fl oz.....	A					
Bayleton 50DF 1.0 oz.....	B					
26GT 2SC 4.0 fl oz.....	C					
Compass 50WG 0.25 oz.....	D					
Daconil Ultrex 82.5WDG 3.2 oz.....	E					
Compass 50WG 0.25 oz.....	F					
Prostar 50WP 2.2 oz.....	G					
Daconil Ultrex 82.5WDG 3.2 oz.....	H					
26GT 2SC 4.0 fl oz.....	I					
10. Signature 80WDG 4.0 oz.....	A-I	3.8 bcd	6.0 ab	4.0 bcd	6.0 a	7.8 a
26GT 2SC 4.0 fl oz.....	A					
3336 50WP 6.0 oz.....	B					
Heritage 50WG 0.2 oz.....	C					
Daconil Ultrex 82.5WDG 3.2 oz.....	D					
Heritage 50WG 0.2 oz.....	E					
Prostar 50WP 2.2 oz.....	F					
Heritage 0.2WG 0.2 oz.....	G					
Daconil Ultrex 82.5WDG 3.2 oz.....	H					
26GT 2SC 4.0 fl oz.....	I					
11. Signature 80WDG 4.0 oz.....	A-I	4.5 bc	6.0 ab	3.3 d	5.0 a	5.8 bcd
Compass 50WG 0.2 oz.....	A-I					
12. Untreated Control.....	--	3.3 de	5.3 ab	4.3 bcd	4.0 a	4.0 e

^z Turfgrass quality on a 1 to 9 scale, where 9=highest quality and 5=acceptable quality.

^y Application code indicates the application date(s) for each treatment component: A, 3 Jun; B, 18 Jun; C, 1 Jul; D, 16 Jul; E, 31 Jul; F, 13 Aug; G, 27 Aug; H, 10 Sep; I, 24 Sep.

^xValues are means of four replicates. Means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test (k=100).

Table 2. Effect of fungicides on visual quality and brown patch incidence in ‘A-1’ creeping bentgrass in Raleigh, NC.

Treatment and rate / 1000 sq ft	Application code	Turf quality ^z			Brown patch (%)
		9 Sep	19 Sep	7 Oct	16 Jul
1. Alude SC 5.5 fl oz.....	A-I ^y	4.3 de	4.8 d	6.5 bc	2 bc
Endorse 2.5WP 4.0 oz.....	A-I				
2. Alude SC 5.5 fl oz.....	A-I	4.3 de	6.3 bcd	7.3 abc	8 abc
Protect 80WP 8.0 oz.....	A-I				
3. Alude SC 5.5 fl oz.....	A-I	6.0 b	8.0 ab	7.8 a	1 c
Spectro 90WDG 4.0 oz.....	A-I				
4. Spectro 90WDG 4.0 oz.....	A-I	4.0 e	6.3 bcd	6.5 bc	2 bc
5. Consyst 67WDG 4.0 oz.....	A-I	4.3 de	6.0 bcd	6.5 bc	1 c
6. Vital 4L 6.0 fl oz.....	ACEGI	5.3 b-e	7.3 abc	6.5 bc	7 abc
Junction 60DF 2.0 oz.....	ACEGI				
Vital 4L 6.0 fl oz.....	BDFH				
Concord 82.5WDG 3.2 oz.....	BDFH				
7. GX-734G 6.0 fl oz.....	ACEGI	5.0 b-e	7.0 a-d	6.5 bc	12 ab
Junction 60DF 1.0 oz.....	ACEGI				
Vital 4L 6.0 fl oz.....	BDFH				
Concord 82.5WDG 3.2 oz.....	BDFH				
8. Signature 80WDG 4.0 oz.....	A-I	5.5 bcd	7.3 abc	7.5 ab	0 c
Bayleton 50DF 1.0 oz.....	A				
26GT 2SC 4.0 fl oz.....	B				
Compass 50WG 0.25 oz.....	C				
Daconil Ultrex 82.5WDG 3.2 oz.....	D				
Daconil Ultrex 82.5 WDG 3.2 oz.....	E				
Compass 50WG 0.25 oz.....	F				
Spectro 90WDG 4.0 oz.....	G				
26GT 2SC 4.0 fl oz.....	H				
26GT 2SC 4.0 fl oz.....	I				
9. Signature 80WDG 4.0 oz.....	A-I	5.3 b-e	7.3 abc	7.8 a	1 c
26GT 2SC 4.0 fl oz.....	A				
Bayleton 50DF 1.0 oz.....	B				
26GT 2SC 4.0 fl oz.....	C				
Compass 50WG 0.25 oz.....	D				
Daconil Ultrex 82.5WDG 3.2 oz.....	E				
Compass 50WG 0.25 oz.....	F				
Prostar 50WP 2.2 oz.....	G				
Daconil Ultrex 82.5WDG 3.2 oz.....	H				
26GT 2SC 4.0 fl oz.....	I				
10. Signature 80WDG 4.0 oz.....	A-I	7.8 a	9.0 a	8.3 a	0 c
26GT 2SC 4.0 fl oz.....	A				
3336 50WP 6.0 oz.....	B				
Heritage 50WG 0.2 oz.....	C				
Daconil Ultrex 82.5WDG 3.2 oz.....	D				
Heritage 50WG 0.2 oz.....	E				
Prostar 50WP 2.2 oz.....	F				
Heritage 0.2WG 0.2 oz.....	G				
Daconil Ultrex 82.5WDG 3.2 oz.....	H				
26GT 2SC 4.0 fl oz.....	I				
11. Signature 80WDG 4.0 oz.....	A-I	5.8 bc	7.5 abc	7.5 ab	1 c
Compass 50WG 0.2 oz.....	A-I				
12. Untreated Control.....	--	4.5 cde	5.5 cd	6.3 c	14 a

^z Turfgrass quality on a 1 to 9 scale, where 9=highest quality and 5=acceptable quality.

^y Application code indicates the application date(s) for each treatment component: A, 3 Jun; B, 18 Jun; C, 1 Jul; D, 16 Jul; E, 31 Jul; F, 13 Aug; G, 27 Aug; H, 10 Sep; I, 24 Sep.

^xValues are means of four replicates. Means within columns followed by the same letter are not significantly different according to Waller-Duncan k-ratio t-test (k=100).