

CREEPING BENTGRASS (*Agrostis palustris* 'Crenshaw')
Dollar spot; *Sclerotinia homoeocarpa*
Turfgrass quality; Abiotic
Algae; Cyanobacteria

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Preventative control of dollar spot on creeping bentgrass putting greens in Raleigh, NC, 2007.

Fungicides were evaluated for preventative control of dollar spot in creeping bentgrass putting greens. This trial was conducted at the Lake Wheeler Turfgrass Field Laboratory in Raleigh, NC on 'Crenshaw' creeping bentgrass. Mowing was performed four times weekly at heights of 0.140 in. (11 Jan-12 Apr), 0.125 in. (13 Apr-24 May), and 0.180 in. (after 25 May) with clippings collected. The site was irrigated to prevent drought stress. Fertilizer was applied as 46-0-0 on 11 Jan and 12 Feb (0.125 and 0.25 lb N/1000 sq ft, respectively), 10-0-30 on 19 Feb (0.5 lb N/1000 sq ft), 26-0-22 on 15 Mar (0.33 lb N/1000 sq ft), 18-3-16 on 13 Apr (0.75 lb N/1000 sq ft), 18-0-12 on 11 May (0.25 lb N/1000 sq ft), and 18-9-18 on 25 May (0.6 lb N/1000 sq ft). Micronutrients were applied as Brexil Multi (3.0 oz/1000 sq ft) on 12 Feb and HEP 35 (5.0 oz/1000 sq ft) on 11 May. Insect pests were suppressed with Allectus GC (2.9 lb/1000 sq ft) on 29 Jun. Cascade Plus (8.0 fl oz/1000 sq ft) was applied on 20 Mar and 2 May, and Revolution (6.0 fl oz/1000 sq ft) was applied on 10 Jul for improved water infiltration. Plots were 3.33 ft x 6 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 a TeeJet 9508E nozzle. Treatments were initiated on 30 Apr, unless otherwise noted in the table, and were reapplied at the appropriate intervals as indicated in the table. The experimental area was inoculated on 24 Apr using rye grain infested with *S. homoeocarpa* isolates Re-18G-4, Re-18G-35, and LWC-5 to encourage dollar spot development. Dollar spot incidence was assessed weekly from 11 Jun through 23 Jul by counting the number of infection centers per plot. Turfgrass quality was evaluated on 4 Jun, 5, 19, and 30 Jul, and 15 Aug using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Data were subjected to analysis of variance and means separation using the Waller-Duncan k-ratio t test (k=100).

Dollar spot incidence increased rapidly during June and remained consistently high through mid-July. Temperatures were normal, and rainfall was sporadic. While total precipitation was above normal in June, 53% of the monthly total occurred on 3 Jun, 31% occurred on 13 Jun, and only 0.2 in. was recorded between 13 Jun and 10 Jul. All treatments provided excellent suppression of dollar spot throughout the experiment. Complete control was maintained with Headway, Banner MAXX, Bayleton, Lynx (both rates), NCSU-EXP-2 (0.4 and 0.5 oz), NCSU-EXP-3 (1.0 oz), SARS-346 (0.5 and 0.75 oz), both SARS-346 + 3336 tank mixtures, SARS-351 (1.0 and 1.5 fl oz), Emerald (0.13 oz), and GF-1948 (2.0 fl oz). Although not statistically different from the most effective treatments, plots treated with Trinity (0.5 or 0.75 fl oz, 14 day interval; 1 fl oz, 28 day interval), Disarm (0.18 fl oz), and Eagle (1.2 fl oz) contained an unacceptable number of dollar spot infection centers on one or more rating dates. Turfgrass quality declined as the study progressed due to persistent heat and algae invasion. On 4 Jun and 5 Jul, all treatments were providing acceptable quality, with Lynx (both rates) and the Tartan + Signature tank mixture providing the highest quality. On 19 Jul, the Tartan + Signature mixture, SARS-346 (0.5 oz, 14-day interval), and SARS-346 (1.0 oz, 28-day interval) were the only treatments with acceptable quality. None of the treatments were providing acceptable turf quality on 30 Jul or 15 Aug, however, the Tartan + Signature mixture was significantly better than the untreated control on both dates. Algae was observed and rated on 13 Jul. Incidence was highly variable in the experimental area, and no significant differences were detected among treatments, however, plots treated with DMI fungicides tended to contain the highest levels of algae infestation.

Treatment, formulation, and rate per 1000 sq ft	Appl. interv. (days)	Dollar spot incidence ^z					
		11 Jun	18 Jun	25 Jun	2 Jul	9 Jul	16 Jul
Tartan 2.4SC 1.0 fl oz.....	14 ^y	0.0 b ^x	0.0 b	2.8 b	0.0 b	0.0 b	0.0 b
Tartan 2.4SC 1.5 fl oz.....	14	0.0 b	0.3 b	0.3 b	0.0 b	0.0 b	0.0 b
Tartan 2.4SC 1.0 fl oz + Signature 80WG 4.0 oz.....	14	0.5 b	0.0 b	3.8 b	0.0 b	0.0 b	0.0 b
Headway 1.39ME 1.0 fl oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Trinity 1.67SC 0.5 fl oz.....	14	3.5 b	6.3 b	18.8 b	14.8 b	22.0 b	10.5 b
Trinity 1.67SC 0.75 fl oz.....	14	0.8 b	6.5 b	18.5 b	8.8 b	17.5 b	5.5 b
Trinity 1.67SC 1.0 fl oz.....	14	0.3 b	1.3 b	7.0 b	1.8 b	4.0 b	1.5 b
Trinity 1.67SC 1.0 fl oz.....	28	1.3 b	7.3 b	20.0 b	11.5 b	14.0 b	9.5 b
Trinity 1.67SC 2.0 fl oz.....	14	0.0 b	0.0 b	0.5 b	0.0 b	0.0 b	0.0 b
Trinity 1.67SC 2.0 fl oz.....	28	0.0 b	0.0 b	5.0 b	1.0 b	0.8 b	0.0 b
Banner MAXX 1.3ME 2.0 fl oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Bayleton 50WG 1.0 oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Eagle WSP 40WP 1.2 oz.....	14	0.0 b	0.0 b	2.3 b	1.0 b	0.5 b	0.0 b
Lynx 2SC 2.0 fl oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
NCSU-EXP-1 0.47 fl oz.....	14	0.0 b	0.0 b	3.8 b	2.0 b	3.5 b	0.0 b
NCSU-EXP-2 0.2 oz.....	14	0.0 b	0.0 b	1.8 b	2.0 b	6.0 b	0.3 b
NCSU-EXP-2 0.4 oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
NCSU-EXP-2 0.5 oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Banner MAXX 1.3ME 1.0 fl oz.....	14	0.0 b	0.0 b	4.8 b	2.0 b	1.3 b	0.5 b
NCSU-EXP-3 0.88 oz.....	14	0.0 b	0.3 b	0.3 b	0.0 b	0.0 b	0.0 b
NCSU-EXP-3 1.0 oz.....	21	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-346 40WP 0.5 oz ^w	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-346 40WP 0.75 oz ^w	21	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-346 40WP 1.0 oz ^v	28	0.0 b	0.3 b	5.0 b	1.8 b	0.0 b	0.0 b
SARS-346 40WP 0.4 oz + 3336 50WP 1.44 oz ^w	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-346 40WP 0.6 oz + 3336 50WP 2.16 oz ^w	21	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-351 20SC 0.5 fl oz ^w	14	0.0 b	0.0 b	0.3 b	0.0 b	0.0 b	0.0 b
SARS-351 20SC 1.0 fl oz ^w	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
SARS-351 20SC 1.5 fl oz ^w	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Insignia 20WG 0.9 oz.....	14	0.0 b	0.0 b	6.0 b	4.8 b	3.8 b	0.0 b
Disarm 4SC 0.36 fl oz.....	14	0.0 b	0.0 b	5.3 b	5.0 b	5.8 b	0.0 b
Disarm 4SC 0.18 fl oz.....	14	2.0 b	7.8 b	19.8 b	21.5 b	21.3 b	6.0 b
ARY0534001 SC 0.35 fl oz + Disarm 4SC 0.1 fl oz.....	14	0.0 b	0.0 b	0.5 b	0.0 b	0.0 b	0.0 b
Emerald 70WG 0.13 oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Emerald 70WG 0.18 oz.....	21	0.3 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
GF-1948 1.22EW 1.0 fl oz.....	14	0.0 b	0.0 b	1.3 b	0.0 b	0.0 b	0.0 b
GF-1948 1.22EW 2.0 fl oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Eagle 1.67EW 1.2 fl oz.....	14	0.0 b	2.8 b	11.0 b	4.5 b	5.5 b	1.8 b
Eagle 1.67EW 2.4 fl oz.....	14	0.0 b	1.0 b	3.3 b	2.0 b	0.8 b	0.0 b
Lynx 2SC 1.0 fl oz.....	14	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b	0.0 b
Quali-Pro Propiconazole 1.3ME 1.0 fl oz.....	14	0.0 b	0.0 b	5.8 b	0.0 b	0.5 b	0.0 b
Untreated Control.....		29.5 a	58.5 a	103.0 a	97.5 a	113.0 a	104.8 a

^z Dollar spot incidence represents the number of dollar spot infections centers per plot.

^y Fungicides were applied: 30 Apr (all treatments), 14 May (14-day treatments), 21 May (21-day treatments), 29 May (14 and 28-day treatments), 11 Jun (14 and 21-day treatments), 25 Jun (14 and 28-day treatments), 2 Jul (21-day treatments), 9 Jul (14-day treatments).

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

^w Treatment first applied on 21 May.

^v Treatment first applied on 29 May.

Treatment, formulation, and rate per 1000 sq ft	Appl. interv. (days)	Dollar spot inc. ^z						Turfgrass quality ^y		Algae inc. (%)
		23 Jul	4 Jun	5 Jul	19 Jul	30 Jul	15 Aug	13 Jul		
Tartan 2.4SC 1.0 fl oz.....	14 ^x	0.0 b ^w	6.8 ab	6.0 c-f	3.5 def	3.5 bcd	1.5 bcd	11.0 a		
Tartan 2.4SC 1.5 fl oz.....	14	0.0 b	6.8 ab	5.3 f	3.8 c-f	3.5 bcd	1.8 bcd	5.5 a		
Tartan 2.4SC 1.0 fl oz + Signature 80WG 4.0 oz.....	14	0.0 b	7.8 a	7.5 ab	5.8 a	4.8 a	4.3 a	0.0 a		
Headway 1.39ME 1.0 fl oz.....	14	0.0 b	5.3 b	5.5 ef	4.3 b-e	3.3 cd	2.5 a-d	0.0 a		
Trinity 1.67SC 0.5 fl oz.....	14	8.5 b	6.3 ab	6.5 a-f	4.5 bcd	3.5 bcd	2.3 a-d	6.5 a		
Trinity 1.67SC 0.75 fl oz.....	14	5.3 b	5.3 b	6.0 c-f	4.5 bcd	4.3 abc	2.8 a-d	2.0 a		
Trinity 1.67SC 1.0 fl oz.....	14	1.3 b	6.3 ab	6.5 a-f	4.8 abc	3.8 a-d	2.3 a-d	7.0 a		
Trinity 1.67SC 1.0 fl oz.....	28	11.5 b	6.0 ab	5.8 def	4.0 b-f	3.8 a-d	2.3 a-d	17.3 a		
Trinity 1.67SC 2.0 fl oz.....	14	0.0 b	5.8 ab	5.8 def	3.5 def	3.8 a-d	2.5a-d	8.0 a		
Trinity 1.67SC 2.0 fl oz.....	28	0.0 b	6.0 ab	6.0 c-f	4.3 b-e	3.8 a-d	2.0 a-d	12.5 a		
Banner MAXX 1.3ME 2.0 fl oz.....	14	0.0 b	5.8 ab	6.0 c-f	3.3 ef	3.5 bcd	1.8 bcd	4.8 a		
Bayleton 50WG 1.0 oz.....	14	0.0 b	5.3 b	5.3 f	3.5 def	3.3 cd	1.3 cd	6.8 a		
Eagle WSP 40WP 1.2 oz.....	14	0.0 b	5.3 b	5.5 ef	4.0 b-f	3.3 cd	2.0 a-d	6.5 a		
Lynx 2SC 2.0 fl oz.....	14	0.0 b	7.8 a	7.8 a	4.5 bcd	3.8 a-d	1.0 d	13.3 a		
NCSU-EXP-1 0.47 fl oz.....	14	0.8 b	6.5 ab	6.5 a-f	4.8 abc	4.0 a-d	3.0 a-d	5.8 a		
NCSU-EXP-2 0.2 oz.....	14	0.0 b	7.0 ab	6.5 a-f	4.5 bcd	4.3 abc	3.3 a-d	4.5 a		
NCSU-EXP-2 0.4 oz.....	14	0.0 b	6.3 ab	6.5 a-f	4.0 b-f	3.5 bcd	2.0 a-d	10.3 a		
NCSU-EXP-2 0.5 oz.....	14	0.0 b	7.0 ab	6.5 a-f	4.5 bcd	4.0 a-d	2.0 a-d	6.5 a		
Banner MAXX 1.3ME 1.0 fl oz.....	14	0.3 b	6.5 ab	7.0 a-d	4.3 b-e	3.8 a-d	1.8 bcd	4.5 a		
NCSU-EXP-3 0.88 oz.....	14	0.0 b	6.8 ab	6.8 a-e	4.0 b-f	4.0 a-d	3.3 a-d	18.5 a		
NCSU-EXP-3 1.0 oz.....	21	0.0 b	6.8 ab	7.0 a-d	4.0 b-f	3.8 a-d	2.5 a-d	18.8 a		
SARS-346 40WP 0.5 oz.....	14	0.0 b	6.3 ab	7.5 ab	5.0 ab	4.0 a-d	2.5 a-d	6.8 a		
SARS-346 40WP 0.75 oz.....	21	0.0 b	5.8 ab	7.3 abc	4.3 b-e	4.0 a-d	2.0 a-d	3.8 a		
SARS-346 40WP 1.0 oz.....	28	0.0 b	6.8 ab	7.3 abc	5.0 ab	4.3 abc	2.5 a-d	4.3 a		
SARS-346 40WP 0.4 oz + 3336 50WP 1.44 oz.....	14	0.0 b	6.8 ab	6.3 b-f	4.5 bcd	4.3 abc	3.8 ab	7.0 a		
SARS-346 40WP 0.6 oz + 3336 50WP 2.16 oz.....	21	0.0 b	6.5 ab	6.8 a-e	4.8 abc	4.5 ab	2.5 a-d	12.0 a		
SARS-351 20SC 0.5 fl oz.....	14	0.0 b	5.8 ab	6.5 a-f	4.3 b-e	4.0 a-d	1.8 bcd	5.0 a		
SARS-351 20SC 1.0 fl oz.....	14	0.0 b	6.5 ab	6.8 a-e	4.8 abc	4.5 ab	2.0 a-d	2.5 a		
SARS-351 20SC 1.5 fl oz.....	14	0.0 b	6.5 ab	7.0 a-d	4.0 b-f	4.0 a-d	2.0 a-d	15.0 a		
Insignia 20WG 0.9 oz.....	14	0.0 b	6.8 ab	7.3 abc	4.0 b-f	4.0 a-d	2.3 a-d	13.8 a		
Disarm 4SC 0.36 fl oz.....	14	0.3 b	7.3 ab	7.0 a-d	4.5 bcd	4.3 abc	3.3 a-d	2.8 a		
Disarm 4SC 0.18 fl oz.....	14	7.0 b	6.8 ab	5.8 def	3.5 def	3.3 cd	2.8 a-d	12.3 a		
ARY0534001 0.35 fl oz + Disarm 4SC 0.1 fl oz.....	14	0.0 b	6.0 ab	6.3 b-f	4.0 b-f	3.8 a-d	2.3 a-d	0.8 a		
Emerald 70WG 0.13 oz.....	14	0.0 b	7.0 ab	6.8 a-e	4.5 bcd	4.5 ab	3.0 a-d	4.0 a		
Emerald 70WG 0.18 oz.....	21	0.0 b	6.5 ab	6.5 a-f	4.8 abc	4.0 a-d	3.5 abc	6.0 a		
GF-1948 1.22EW 1.0 fl oz.....	14	0.0 b	6.8 ab	6.8 a-e	4.0 b-f	3.8 a-d	1.5 bcd	7.5 a		
GF-1948 1.22EW 2.0 fl oz.....	14	0.0 b	6.0 ab	7.0 a-d	4.3 b-e	3.3 cd	1.8 bcd	12.8 a		
Eagle 1.67EW 1.2 fl oz.....	14	2.5 b	7.0 ab	6.0 c-f	4.3 b-e	3.3 cd	1.8 bcd	20.5 a		
Eagle 1.67EW 2.4 fl oz.....	14	0.3 b	5.8 ab	6.8 a-e	3.5 def	3.5 bcd	1.8 bcd	13.0 a		
Lynx 2SC 1.0 fl oz.....	14	0.0 b	7.8 a	7.5 ab	4.5 bcd	4.0 a-d	2.0 a-d	14.5 a		
Quali-Pro Propiconazole 1.3ME 1.0 fl oz.....	14	0.3 b	6.3 ab	7.0 a-d	4.0 b-f	3.8 a-d	2.0 a-d	14.8 a		
Untreated Control.....		84.3 a	5.5 b	3.5 g	3.0 f	3.0 d	1.5 bcd	0.0 a		

^z Dollar spot incidence represents the number of dollar spot infections centers per plot.

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

^x Fungicides were applied: 30 Apr (all treatments), 14 May (14-day treatments), 21 May (21-day treatments), 29 May (14 and 28-day treatments), 11 Jun (14 and 21-day treatments), 25 Jun (14 and 28-day treatments), 2 Jul (21-day treatments), 9 Jul (14-day treatments).

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

^w Treatment first applied on 21 May.

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