CREEPING BENTGRASS (*Agrostis palustris* 'SR1020')
Brown patch; *Rhizoctonia solani*
Visual quality

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Brown patch control in creeping bentgrass using Serenade AS, 2003.

Serenade AS, a biological fungicide containing the bacterium *Bacillus subtilis*, was assessed for its ability to control brown patch when applied alone, in rotations, or in tank-mixtures with Daconil Ultrex. This trial was conducted at North Carolina State University Turfgrass Field Lab in Raleigh, NC on 'SR1119' creeping bentgrass maintained under golf course putting green conditions. Mowing was performed three times weekly at a height of 0.157 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), as 18-3-18 on 5 May (0.5 lb N/1000 sq ft), and as 18-4-0 on 15 May (0.5 lb N/1000 sq ft). Insect pests were suppressed with Dursban (1.5 fl oz/1000 sq ft) on 16 May, 27 Jun, and 25 Jul and with Talstar (0.25 fl oz/1000 sq ft) on 18 Aug. Canteen wetting agent (6 fl oz/1000 sq ft), was applied on 24 Apr, 12 May, 24 Jun, and 1 Aug to control localized dry spot. 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 CO_2 powered sprayer at 40 psi using TeeJet 8004 flat fan nozzles. All treatments were initiated on 3 June. Fungicides were reapplied at the appropriate intervals as indicated in the table. Percent turf area exhibiting brown patch symptoms were assessed on 9 and 30 Jul. Turfgrass quality was evaluated on 28 Aug, using a 1 to 9 scale (9=best, 5=acceptable) based on color, density, and uniformity. Clippings from the individual plots were collected on 15 Jul using a Toro 1000 walk behind reel mower. Clippings were oven-dried, ground, and submitted to the North Carolina Department of Agriculture Agronomic Division for analysis of nitrogen content. Data were subjected to analysis of variance and means separation by Waller-Duncan k-ratio t test (k=100).

The first symptoms of brown patch were observed on 9 Jul. Disease pressure was light throughout 2003 due to unusually cool weather conditions. No treatments provided significant control of brown patch on 9 Jul and 30 Jul. On 30 Jul, plots treated with Serenade (1% and 2% v/v) and Serenade + Daconil Ultrex (2% v/v + 1.8 oz) exhibited increased brown patch incidence compared to Daconil Ultrex alone (1.8 oz and 3.2 oz). None of the treatments improved turf quality compared to the Untreated Control on 28 Aug. Plots treated with Monopotassium phosphate (1.8 oz, 14 day) exhibited reduced turf quality on 28 Aug compared to plots treated with Serenade (2% v/v) alternated with Daconil Ultrex (3.2 oz), Serenade + Daconil Ultrex (2% v/v + 1.8 oz), and Daconil Ultrex (1.8 and 3.2 oz). No treatments significantly increased or decreased the nitrogen content of leaf tissue compared to the Untreated Control. Based on limited data collected during this trial, applications of Serenade AS may encourage brown patch development in creeping bentgrass. Additional research is needed to further explore this observation.

Treatment and rate / 1000 sq ft	Application code[z]	Brown patch incidence (%) 9 Jul	30 Jul	Turf quality[y] 28 Aug	Nitrogen content (%)[x] 15 Jul
Serenade AS 1% v/v	A-O	15 a[w]	11 a	4.3 bc	4.69 a
Serenade AS 2% v/v	A-O	15 a	11 a	5.3 abc	4.77 a
Serenade AS 2% v/v *alt* Daconil Ultrex 82.5WDG 3.2oz	ADGJM BEHKN	6 a	2 ab	6.5 a	4.78 a
Serenade AS 2% v/v + Daconil Ultrex 82.5WDG 1.8oz	ACEGIKMO	7 a	11 a	6.5 a	4.88 a
Daconil Ultrex 82.5 WDG 3.2oz	BEHKN	3 a	0 b	6.0 ab	4.90 a
Daconil Ultrex 82.5 WDG 1.8oz	ACEGIKMO	3 a	0 b	6.5 a	4.80 a
Monopotassium phosphate 0-52-34 1.8 oz	ACEGIKMO	8 a	9 ab	4.0 c	4.83 a
Untreated control		5 a	3 ab	5.3 abc	4.93 a

[z]Application code indicates the application date(s) for each treatment component: A=3 Jun; B=12 Jun; C=18 Jun; D=25 Jun; E=1 Jul; F=9 Jul; G=16 Jul; H=23 Jul; I=30 Jul; J=6 Aug; K=13 Aug; L=20 Aug; M=27 Aug; N=3 Sep; O=10 Sep.
[y]Turfgrass quality on a 1 to 9 scale, where 9=highest quality and 5=acceptable quality.
[x]Nitrogen content of leaf tissue samples measured by the North Carolina Department of Agriculture Agronomic Division.
[w]Values 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).