CREEPING BENTRASS (*Agrostis palustris* 'A-1')
Brown patch; *Rhizoctonia solani*

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Evaluation of EcoGuard for control of brown patch in creeping bentgrass, 2004.

EcoGuard, a biofungicide containing *Bacillus licheniformis*, was evaluated for its ability to suppress brown patch development when applied alone or in combination with select fungicides. This trial was conducted at the Lake Wheeler Turfgrass Field Lab in Raleigh, NC on 'A-1' creeping bentgrass maintained under golf course putting green conditions. Mowing was performed 3 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 19-5-9 on 5 Jan, 2 Feb, and 1 Apr (0.5 lb N/1000 sq ft) and as 25-5-15 on 5 Mar (1 lb N/1000 sq ft), 23 Apr (0.5 lb N/1000 sq ft), and 13 May (0.5 lb N/1000 sq ft), and as 29-2-3 (0.3 lb N/1000 sq ft) on 5 Jul, 23 Jul, and 11 Aug. Insect pests were suppressed with Dursban Pro (1 fl oz/1000 sq ft) on 7 May, 9 Jul, and 25 Aug and with Talstar (0.25 fl oz/1000 sq ft) on 9 May and 12 Aug. Surfside Wetting Agent (6 fl oz/1000 sq ft) was applied on 7 May, 14 Jun, and 9 Jul to control localized dry spots. 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 CO_2 powered sprayer at 40 psi using TeeJet 8004 nozzles. All treatments were initiated on 29 Jun and were reapplied at the appropriate intervals as indicated in the table. The experimental area was inoculated on 9 Jul using rye grain infested with *Rhizoctonia solani* to encourage brown patch development. Percent turf area exhibiting brown patch symptoms was assessed on 4 Aug, 13 Aug, 23 Aug, and 1 Sep. Data were subjected to analysis of variance and means separation by Waller-Duncan k-ratio t test (k=100).

Little brown patch activity was observed in the experimental area prior to inoculation with *Rhizoctonia solani* on 9 Jul. Brown patch incidence increased steadily throughout August due to warm temperatures and a total of 9.9 inches of rainfall. All Daconil Ultrex and Heritage treatments provided excellent control of brown patch on 4 Aug, 13 Aug, 23 Aug, and 1 Sep. Addition of EcoGuard to Daconil Ultrex or Heritage in mixtures or rotations had no significant impact on brown patch control. Applications of EcoGuard, WP140, and WP145 did not significantly reduce in brown patch incidence on any rating date. Applications of EcoGuard on 14 day intervals induced a significant increase in brown patch incidence on all 4 rating dates, possibly due to the presence of plant available nitrogen in the product formulation. EcoGuard did not increase brown patch incidence when applied on 7 day intervals, however. *Bacillus licheniformis* may have some activity against *R. solani* which counteracted the nitrogen effect when applied on 7 day intervals. Alternatively, increased nitrogen rates provided by the 7 day treatment may have allowed the creeping bentgrass to outgrow the brown patch symptoms faster than the disease could develop.

Table 1. Evaluation of EcoGuard for control of brown patch in creeping bentgrass, 2004.

Treatment and rate / 1000 sq ft	Spray interval (days)	Brown patch incidence (%)			
		4 Aug	13 Aug	23 Aug	1 Sep
EcoGuard SC 20 fl oz	7[z]	8 b[y]	9 cde	21 b	46 bc
EcoGuard SC 20 fl oz	14	18 a	28 a	38 a	68 a
Daconil Ultrex 82.5WDG 1.62 oz	14	0 d	2 ef	0 c	5 d
Daconil Ultrex 82.5WDG 2.45 oz	14	0 d	1 f	0 c	0 d
Daconil Ultrex 82.5WDG 3.2 oz	14	0 d	0 f	2 c	0 d
Daconil Ultrex 82.5WDG 3.2 oz	28	1 cd	0 f	1 c	3 d
Heritage 50WG 0.1 oz	14	0 d	3 def	2 c	0 d
Heritage 50WG 0.2 oz	28	0 d	2 ef	2 c	1 d
Daconil Ultrex 82.5WDG 3.2 oz alt EcoGuard SC 20 fl oz	14	0 d	0 f	2 c	9 d
EcoGuard SC 20 fl oz + Daconil Ultrex 82.5WDG 3.2 oz	14	0 d	0 f	1 c	0 d
EcoGuard SC 20 fl oz Daconil Ultrex 82.5WDG 2.45 oz	14	0 d	2 def	1 c	0 d
EcoGuard SC 20 fl oz + Daconil Ultrex 82.5WDG 1.62 oz	14	0 d	2 def	1 c	8 d
Heritage 50WG 0.2 oz alt EcoGuard SC 20 fl oz	14	0 d	0 f	0 c	2 d
EcoGuard SC 20 fl oz + Heritage 50WG 0.1 oz	14	0 d	0 f	1 c	0 d
WP 140 WP 5 oz	7	9 b	13 bc	26 b	53 abc
WP 140 WP 5 oz	14	8 b	12 bc	19 b	40 bc
WP 145 WP 1 oz	7	10 b	17 b	24 b	32 c
WP 145 WP 1 oz	14	10 b	17 b	27 ab	58 ab
Untreated Control	--	6 bc	10 bcd	21 b	44 bc
Untreated Control	--	6 bc	8 c-f	19 b	39 bc

[z]Fungicides were applied on 29 Jun (all treatments), 6 Jul (7 day treatments), 13 Jul (7 and 14 day treatments), 22 Jul (7 day treatments), 29 Jul (all treatments), and 5 Aug (7 day treatments).
[y]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).