



# Chemical Control of Brown Patch Caused by *Rhizoctonia solani* on Bentgrass

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Brown patch, caused by *Rhizoctonia solani*, is a major summer disease of cool-season grasses such as the bentgrasses, bluegrasses, fescues, and ryegrasses. Brown patch commonly occurs during extended periods of hot (days: >80°F; nights: >68°F) and humid weather. The fungus overwinters in the form of resting structures called sclerotia, either within infected plant parts or in the soil. The sclerotia can survive for several years without causing the disease on a susceptible grass. During the summer, periods of rain and 100% relative humidity significantly increase disease development. Turfgrass becomes more susceptible when they are maintained at high nitrogen levels during summer months, which make them more lush and succulent.

Plant stand symptoms, on the basis of individual plants, vary according to the height of mowing. On turf maintained above one inch, irregular gray or tan lesions with a dark brown border are observed on the

infected and colonized leaves. On close-cut turf (<one inch), no distinct lesions are readily observed, but the symptoms appear as general leaf necrosis.

Turf stand symptoms on high-cut turf are shown as brown or tan patches of diseased turf ranging up to several feet in diameter. In early morning, white mycelium of the fungus can be visible on infected leaves and stems. In most situations, the turf in these patches is thinned out rather than completely killed. No circular, distinct pattern can be seen, and disease appears as a diffuse blight. On tall fescue, symptoms can be observed on individual leaves as irregular tan or light brown lesions surrounded by dark brown borders and not necessarily in patches. On the other hand, when close-cut turf (<one inch) such as golf course putting greens and fairways becomes infected, brown patches are often surrounded by a dark brown, purplish ring called a "smoke ring" (Figure A, B, and

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**Eligible organizations include:**

- Wee One Foundation
- Wisconsin Golf Course Superintendents Association
- Wisconsin Landscape Federation
- Wisconsin Nursery Association
- Wisconsin Turfgrass Association

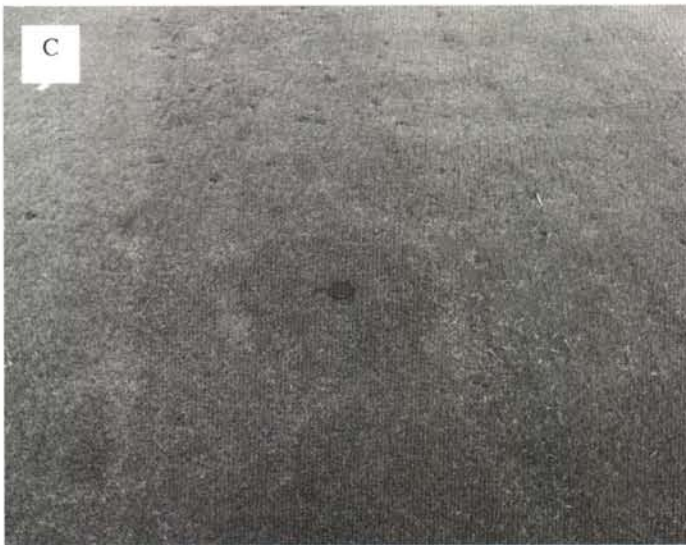
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Symptoms of brown patch on bentgrasses. Note A: light brown patches with dark brown borders/rings around the periphery of the patches, called smoke rings in various sizes, on creeping bentgrass on golf course putting greens. Smoke rings are more pronounced in the early morning hours, gradually dissipating by midday; B: a close-up of the small patch shown in Figure A; C: light brown patches without distinct smoke rings in various sizes on colonial bentgrass on golf course fairways, which are typical in shorter cut grass shown in the Figure A and B.

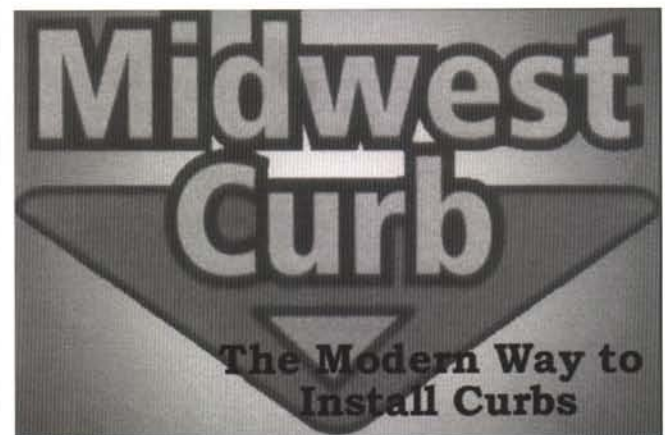


C). The smoke ring indicates evidence of active fungal growth for brown patch development and is more pronounced in the morning, gradually dissipating by midday. Brown patch typically does not result in damage to all stems and tillers within a developing patch; therefore, the turf may recover when disease pressure is reduced due to change in climate conditions or implementation of cultural and chemical control practices.

The objective of this study was to determine the efficacy of fungicides for controlling *Rhizoctonia* blight (Brown Patch) incited by *Rhizoctonia solani*, which was carried out under natural conditions at the O.J. Noer Turfgrass Research and Education Facility in summer of 2005.

## MATERIALS AND METHODS

The study was conducted at the O.J. Noer Turfgrass Research and Education Facility on a stand of colonial bentgrass (*Agrostis capillaris* 'SR7150') maintained at 0.5 inch cutting height. Colonial bentgrass is more susceptible to brown patch than the other bentgrass species. The individual plots measured 3 ft X 10 ft and were arranged in a randomized complete block design with four replications. Individual treatments were applied at a nozzle pressure of 40 p.s.i using a CO<sub>2</sub> pressurized boom sprayer equipped with two XR Teejet 8005 VS nozzles. All fungicides were agitated



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by hand and applied in the equivalent of 2 gallons of water per 1000ft<sup>2</sup>. Treatments were initiated on June 21st and applied on July 5th (14 Day), and July 19th (14 & 28 Day). Plots were not inoculated, however, plots did receive extra irrigation (200% evapotranspiration) and biweekly applications of 0.5 lb N/1000ft<sup>2</sup> when conditions were warm to induce disease development. Visual ratings of the percent brown patch per plot were recorded on June 28th, July 8th, July 18th, and July 25th. The data was subjected to an analysis of variance to determine statistically significant differences between treatments.

## RESULTS AND DISCUSSION

Most of the treatments tested significantly reduced disease severity when compared to the untreated control. It seemed that first and second applications of some (#2, 3, 4, 5, 6, 7, 8, 9, 20) of the treatments did not control the disease completely but the second (28 days interval with high rate) and the third (14 days interval with low rate) applications significantly knocked down the disease. The level of disease control by the strobilurin fungicides (Compass at 0.15 oz/M, Heritage at 0.2 oz/M, and Insignia at 0.5 oz/M) applied at low label rates every 14 days was not different from ones at high label rate applications (0.25, 0.4, and 0.9 oz/M,

respectively) every 28 days. Heritage and Insignia completely controlled the disease (0% damage). Prostar (1.5 oz/M) controlled the disease up to 0.5%. A combination of Banner MAXX (1 fl oz/M) and Heritage TL (0.5 fl oz/M) also had a very good control of the disease (1.3% damage). It seemed that a few applications (two and three times with 14 and 28 day interval, respectively) immediately after the onset of symptoms were sufficient to control the disease effectively. No significant differences in efficacy between Heritage and Heritage TL were observed in our trial. No phytotoxicity was observed for any treatments during the duration of the trial. ♡

\*If difference in mean values of two treatments is more than LSD value, then the two treatments are significantly different from each other at P=0.05.

Treatment	Rate		Interval	Rating dates (percent disease areas)			
				6/29/05	7/8/05	7/18/05	7/25/05
1 Untreated Control				1.8	15	47.5	62.5
2 Insignia	0.9	OZ/M	28 Day	0	0	0	0
3 Insignia	0.5	OZ/M	14 Day	0	5	0.5	0
4 Banner MAXX	1						
Heritage TL	0.5	FL OZ/M	28 Day	0	0	6.3	1.3
5 Heritage TL	1	FL OZ/M	14 Day	0	0	1.3	1.3
6 Heritage TL	0.5	FL OZ/M	14 Day	0	1.3	3.8	0.5
7 Heritage	0.2	OZ/M	14 Day	0	1.3	1	0
8 Heritage	0.4	OZ/M	28 Day	0	2.5	1.3	0
9 Compass	0.15	OZ/M	14 Day	0	7.3	7.5	5
10 Compass	0.25	OZ/M	28 Day	0	2.5	19.5	6.3
11 Endorse	4	OZ/M	14 Day	2	8.8	10	11.3
12 26GT	4	FL OZ/M	28 Day	8	23.8	35	18.8
13 Curalan	1	OZ/M	28 Day	8.3	20	37	30
14 Medallion	0.5	OZ/M	14 Day	3.8	6.8	13	10.5
15 Banner MAXX	1	FL OZ/M	14 Day	10	18.8	30	28.8
16 Rubigan	1.5	FL OZ/M	14 Day	0	6.8	12.3	30
17 Eagle	1.2	FL OZ/M	14 Day	0	8.8	23.8	16.3
18 Bayleton	0.5	OZ/M	14 Day	3.8	8.8	9.3	13.8
19 Prostar	1.5	OZ/M	14 Day	0	7.5	1.3	0.5
20 3336F	4	FL OZ/M	14 Day	1.5	5	7.5	5
21 Spectator	0.37	FL OZ/M	14 Day	1.3	8.8	10	35
22 Spectator	0.72	FL OZ/M	28 Day	1.3	7.5	16.3	15
23 18 Plus	2	FL OZ/M	14 Day	5.5	9.3	20	12.5
LSD (P=0.05)*				NS	10.8	20.9	18.6

Percent brown patch ratings from O. J. Noer Turfgrass Research and Education Facility, Verona, WI