

## WINTER BROWN PATCH

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Turfgrass diseases caused by Rhizoctonia solani are typically thought to be associated with warm humid weather. It is therefore with some surprise that pathologists occasionally isolate R. solani-like fungi from diseased turfgrass during the fall, winter, and spring, as well as during the summer. It has become increasingly clear to pathologists that these pathogens also cause diseases of turfgrasses during the cool, wet seasons, and that laboratory cultures of these "cool-weather" Rhizoctonia isolates differ slightly from the "warm-weather" isolates. Research by Ms. Patricia L. Sanders and associates, including Dr. Herbert Cole, Jr., at the Pennsylvania State University has now shown that differences in these isolates of "Rhizoctonia" are due to the fact that the cool-weather types are not truly Rhizoctonia solani; they are members of the similarly-appearing genus Ceratobasidium. Research on these diseases and their causal pathogens is not being conducted in my laboratory at Cornell University; however, I have observed the disease on creeping bentgrass putting greens in New York, and have conducted an evaluation of fungicides on one affected green. This report is to describe the disease as it appears on bentgrass in New York State, and to summarize some of the research being conducted in Pennsylvania by Ms. Sanders.

**SYMPTOMS:** Rings of bleached grass range from 4 to 20 inches in diameter on putting greens and their aprons and may become so numerous that the rings coalesce into a mosaic. The ring is composed of an outer band of bleached grass blades which may be covered by a grayish-brown mycelium during periods of peak pathogen activity, producing a gray halo effect. The discolored band may be up to several inches across. The grass in the center of the ring is either unaffected and remains green, or it becomes green after the advancing band of fungus has passed. Leaf blades first become bleached at the tip and this blighting then moves downward toward the sheath, but I have not observed blighting of the lower sheath and crown. Thin white to gray mycelial mats may form on the sheath-end of the grass blades, and light-colored sclerotia may form on the rhizomes near the soil and thatch surface. The disease appears to remain superficial on putting greens, but it should be remembered that our current knowledge is based on very few observations and exceptions to these statements are likely to occur.

**THE FUNGUS:** Rhizoctonia-like fungi are easily isolated from sclerotia, mycelial mats, and from the margins of leaf lesions. Isolations may be made on potato-dextrose-agar medium incubated in a refrigerator. Sanders, Burpee and Cole (1978) have identified a number of these fungi, including several from the diseased greens described here, as species of Ceratobasidium. These fungi were able to grow in the laboratory at temperatures as low as 4°C and as high as 30°C, with the optimum at 21-28°C. Pathogenicity to 'Penncross' and to 'Emerald' creeping bentgrass occurred at 27°C down to 10°C, which was the lowest temperature included in their tests. Sanders et al. (1978) concluded that their greenhouse and laboratory tests were consistent with the observance of snow mold-like injury to turfgrass in the winter.

Identification of Ceratobasidium is best left to mycologists. Field-identification of Rhizoctonia-like fungi from disease turfgrass in the late-Fall to mid-Spring can be considered reason to suspect that these fungi may be a species of Ceratobasidium rather than of Rhizoctonia.

**DISEASE OCCURRENCE:** Winter brown patch is an ill-defined disease that may occur during the cool seasons. Occurrence in New York have been primarily during

the Fall and Spring, although the most severe occurrence was during the coldest part of the mild winter of 1973-1974. In the latter instance there were repeated cycles of snow cover and thawing, and the disease became progressively worse each time the snow was thawing. Some thinning of the turf occurred, but plants did not die.

The disease has been observed only on creeping bentgrass (Sanders, et al., 1978; Smiley, 1975), but the host range is not known. Presumably many grass species could be susceptible since the bentgrass pathogenicity tests of Sanders et al. (1978) were conducted with isolates from bentgrass, tall fescue, cucumber, peanut, soybean, and other unidentified sources. Rhizoctonia, which is similar to Ceratobasidium, is known to have an extremely large host range.

The results of a survey that I conducted in April 1974 indicated that the disease had been observed in Pennsylvania, Ohio, Connecticut, New York, and Virginia. It undoubtedly also occurs in other states. All reports were from observations of the disease on putting greens.

CONTROL: Essentially nothing is known about the control of this disease in the field. The turfgrass isolates tested in the laboratory (Sanders et al. 1978) were sensitive to the presence of chlorothalonil (Daconil 2787, Scott's 101V, and others), iprodione (RP 26019), chloroneb (Tersan SP, Scott's Fungicide II, and others), benomyl (Tersan 1991, Scott's Fertilizer plus DSB, and others), and of pentachloronitrobenzene "PCNB" (Terraclor, Turfcide, Scott's FFII, the major constituent in Actidione RZ, and others). One fungicide that was not active against these fungi was anilazine (Dyrene, Scott's Fungicide III, and others).

I conducted a typical snow mold control investigation at the Mt. Kisco County Club in New York (Smiley, 1975) and winter brown patch occurred unexpectedly. The results were interesting. The disease did not occur on the nontreated control plot, on the nontreated practice green at the Mt. Kisco CC, and on nontreated greens at nearby golf courses. However, the disease totally covered the 17 fungicide-treated greens at Mt. Kisco, and was also prevalent on treated greens at other clubs. The fungicides used at Mt. Kisco were the snow mold protectants Tersan SP and Actidione Thiram. On my plot very little disease occurred where PCNB products were used. The disease was also slight where a low rate (4 oz/1000 ft<sup>2</sup>) of Tersan SP, Actidione Thiram, or Actidione TGF was used, but the disease became dramatically more severe as the application rate for these chemicals was increased to 8 oz/1000 ft<sup>2</sup>. Combinations of these fungicides provided variable responses. Some pesticides evidently altered the competition between Ceratobasidium and other microorganisms, which allowed the pathogen to become more active than on nontreated areas. Superintendents' attempts to suppress the disease with frequent applications of various fungicides at high rates on many putting greens failed to halt the disease's progress.

This disease has apparently not caused more than a slight thinning of the turfgrass in all of the instances that I am aware of. The symptoms diminish rapidly with the advent of warm weather, and have disappeared after the second mowing in the Spring. Since the disease appears to be superficial and since its occurrence and its response to fungicides is still unpredictable, chemical control of winter brown patch is not recommended at this time. Research at Pennsylvania State University is sure to yield more knowledge about this disease and about its control.

#### Literature Cited

Sanders, P. L., L. L. Burpee, and H. Cole, Jr. 1978. Preliminary studies on binucleate turfgrass pathogens that resemble Rhizoctonia solani. *Phytopathology* 68:145-148.

Smiley, R. W. 1975. Fungicides for controlling winter brown patch of creeping bentgrass. *Fungicide and Nematicide Tests* 30:117-118.