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Rhizoctonia blight disease in turfgrasses, described

The soil-inhabiting fungus, *Rhizoctonia solani*, is responsible for causing numerous diseases of plants worldwide and under diverse environmental and ecological conditions. Historically, a French mycologist, De Candolle, first described the genus Rhizoctonia in 1815. However, a German mycologist, Kuhn, is credited with naming the fungus because of his early work on the ability of R. solani to cause disease on cultivated plants. Today, *R. solani* is pathogenic to over 200 grass species worldwide and is the causal agent for Rhizoctonia blight (formerly called "brown patch") in turfgrasses.

Rhizoctonia blight is considered to be a highly destructive, foliar disease on both cool- and warm-season turfgrasses. The disease was first described from observations made in 1913 on a creeping bentgrass putting green near Philadelphia, PA. At that time, the disease was named "brown patch", however, turfgrass pathologists recently changed the name to Rhizoctonia blight. Further observations on Rhizoctonia blight were recorded from field work conducted by U.S.D.A. scientists in the 1920's and 1930's. These early investigations led to the development of the science of turfgrass pathology and turfgrass disease management.

Rhizoctonia blight is considered to be a highly destructive, foliar disease on both cool- and warm-season turfgrasses.

Fig. 1. Mycelium of Rhizoctonia solani, the causal agent of Rhizoctonia blight, infecting perennial ryegrass. This is referred to as a "sign" of the pathogen.

The biology and lifecycle of R. solani as a turfgrass pathogen is well documented. The fungus survives as thick-walled mycelial masses during periods when environmental conditions are unfavorable for fungal growth. These mycelial masses are called sclerotia or bulbils, and they

Fig. 2 With Rhizoctonia blight, leaf lesions are commonly observed on wide blade turfgrass such as tall fescue.

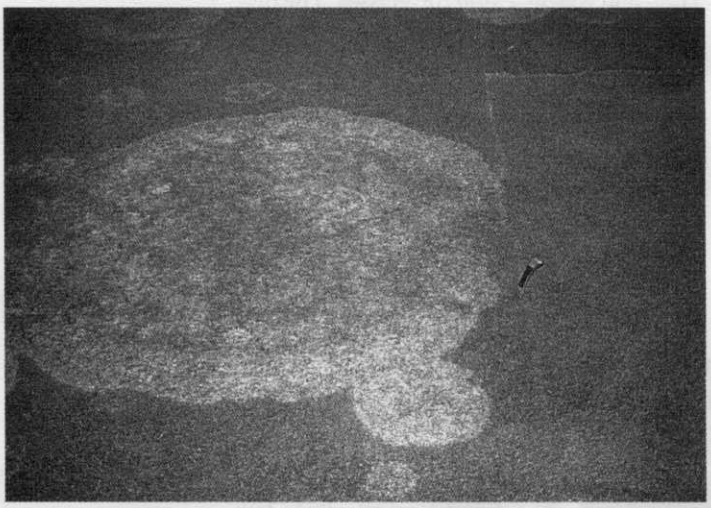

Fig. 3. A circular ring of blighted turfgrass, which is a characteristic symptom of Rhizoctonia blight on a bentgrass putting green.

reside in the upper layers of soil, thatch, and plant debris. The bulbils are very difficult to see with the naked eye. They may germinate over a temperature range of 45 to 105°F, with an optimum germination temperature of about 80oF.

The optimum temperature for infection and disease development varies among turfgrass species and Rhizoctonia biotypes (referred to as "anastamosis groups"). The fungus is capable of saprophytic growth in soil – meaning that the fungus can survive from dead, decaying organic matter. When the bulbils germinate, the fungus spreads radially in the upper soil surface or thatch to form a roughly circular colony.

During warm, moist and humid conditions, typically from late spring through late summer, the fungus can spread over the soil and up onto moist turfgrass sheaths and leaves. Gray- to white-colored fungal mycelium form an infection cushion, which penetrate the leaf tissue causing cell contents to ooze-out into intercellular spaces. Visual observations of the fungal mycelium infecting the turfgrass are referred to as a "sign" of the fungal pathogen (figure 1). Infected leaf tissue appears water-soaked and darkened. Turfgrass leaves then wilt and turn brown upon exposure to sunlight or a drying wind. When plant tissues decompose, bulbils can form again on or in dead tissues, and are released into the thatch and soil.

Rhizoctonia blight symptoms vary depending on turfgrass species and cultivar, level of turfgrass maintenance, soil and environmental conditions, and Rhizoctonia biotype. Infected turfgrass will display roughly circular patches of blighted and necrotic foliar tissue. Tan lesions with dark borders, where necrotic and green tissue meet, are sometimes evident on diseased leaves (Fig. 2).

In cool-season turfgrasses, Rhizoctonia blight is favored by periods of warm, humid, and moist environmental conditions. On closely mowed cool-season turfgrasses (for example, a bentgrass putting green or fairway height turfgrass), circular or irregular-shaped patches of blighted turfgrass are commonly observed (Fig. 3). A darkened, grayish-black border at the patch margin is called a "smoke-ring", and may be evident during the early morning hours. The "smoke-ring" is a sign that reveals the presence of mycelium actively infecting the leaf tissue, as indicated by water-soaking of leaves on closer, visual inspection (Fig4). On high-cut cool-season turfgrasses (for example, the fine fescues, Kentucky bluegrass, perennial ryegrass, and tall fescue), a

light brown, circular patch of blighted leaf tissue is the primary symptom and patches often appear without a "smoke-ring" (Fig. 5). Leaf lesions are easily detected on wide leaf blades (for example, tall fescue), and often fungal mycelium can be observed covering wet leaves during the early morning hours.

On warm-season turfgrasses (for example, bermudagrass, centipedegrass, St. Augustinegrass, and zoysiagrass), blighted patches commonly are observed in the spring when these grasses break dormancy, or in the fall as they approach dormancy. Leaf sheath and basal rots are associated with Rhizoctonia blight in warm-season grasses.

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Fig. 4. Notice the Rhizoctonia solani mycelium active on the patch margins in this fairway height perennial ryegrass.

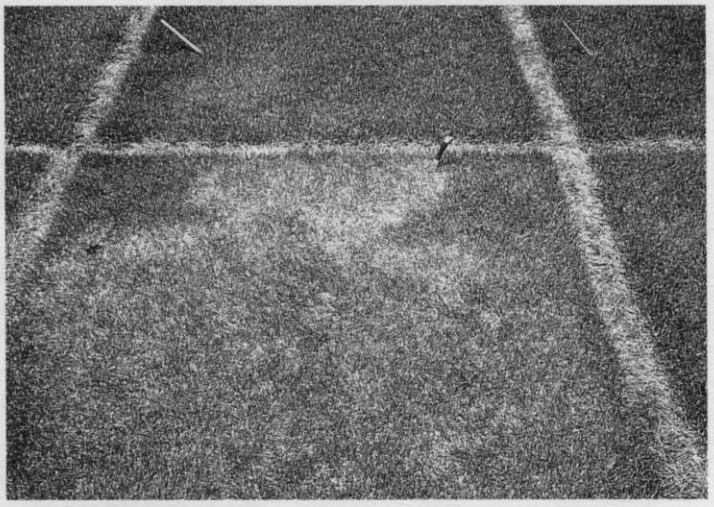

Fig. 5. Rhizoctonia blight symptoms observed on Kentucky bluegrass.

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The site, whichis currently under construction, will also contain articles and information originally published in LANDSCAPE MANAGEMENT and *Athletic Turf Maintenance & Technology,* which, along with TurfGrass TRENDS, make up the Advanstar Communications, Inc. Landscape Group of publications.