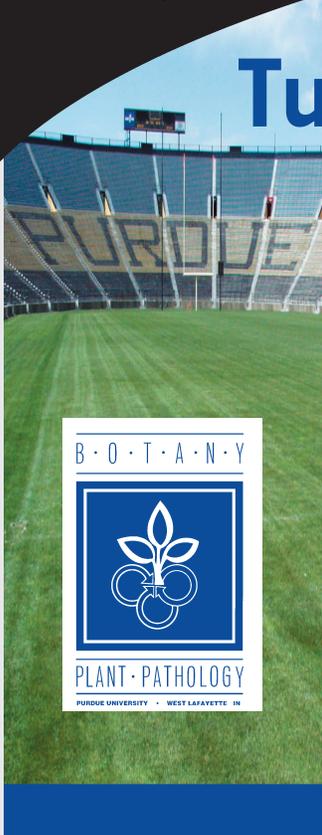


Turfgrass Disease Profiles

Rhizoctonia Large Patch

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- Gray Snow Mold
- Pink Snow Mold
- Leaf Spot/Melting Out
- Red Thread
- Dollar Spot
- Brown Patch
- Gray Leaf Spot
- Anthracoze
- Pythium Blight
- Leaf Rust
- Powdery Mildew
- Slime Mold
- Fairy Ring
- Take All Patch
- Summer Patch
- Necrotic Ring Spot

Rhizoctonia Large Patch

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Rhizoctonia large patch (RLP) of zoysiagrass (also called zoysia patch) is the most significant infectious disease of the zoysiagrass (*Zoysia japonica*) species. RLP is caused by a strain of *Rhizoctonia solani* that causes damage primarily to zoysiagrass (rarely bermudagrass). Despite being closely related to the pathogen responsible for brown patch on cool-season turfgrasses, the RLP strain only infects warm-season turfgrasses. The disease results in areas of thin turf that may be colonized by other grasses and weed species. Extensive patches diminish turf quality by disturbing the aesthetic value and reducing the playability of turf surfaces (Figures 1 and 2). Disease development weakens, but does not normally kill swards of zoysiagrass.

RLP symptoms are normally evident in fall and spring, as zoysiagrass enters and emerges from winter dormancy. Rapidly growing turf during the summer heat can mask the effects of underlying infection and drastically diminish symptom expression. Initial symptoms of RLP are small areas (up to 12 inches in diameter) where leaf blades assume a tan-orange color (Figure 3). The areas expand rapidly into well-defined patches of thin, off-color turf with a tan-orange color at the margins (Figure 4). Affected plants show various stages of decay, from mild leaf decline to shoot necrosis (Figure 5). Crown lesions interfere with upward movement of nutrients and water, causing leaves to collapse and die.

The pathogen survives locally in turf debris and is favored by increased levels of thatch and soil moisture. Patches enlarge as a result of radial growth from an initial infection



Figure 1



Figure 2



Figure 3

center. More patches may occur, clustered around the original, as the pathogen is spread with grass clippings to other parts of the turf stand (Figure 6). Excess nitrogen (N) during the time of pathogen activity can favor rapid patch enlargement. Disease development is favored by moderate temperatures (50-70 degrees F) and long dew periods in spring, fall, and during cool summers. Symptoms are evident on both actively growing and dormant zoysiagrass. Figures 7 and 8 show the same research plot as it appeared on September 17, 2000, and after the first heavy frost on October 3, 2000.

Genetic Control

There is little or no known measurable resistance to *R. solani* among common zoysiagrass varieties.

Cultural Control Options

Cultural control options for managing RLP include maintaining a limited fertilizer program and adjusting summer irrigation schedules to avoid lengthening the duration of leaf wetness. Keeping in mind that the disease is favored by excess N, fertilizing zoysia on a schedule compatible with cool-season grasses (applying the bulk of N in the fall) will increase the likelihood of damage. As a warm-season grass, zoysia should be fertilized during the summer (when root growth is optimum), and when N should not influence RLP development. Zoysiagrass requires little N and most turf managers apply no more than two pounds of N per 1,000 square feet between May and mid-August. In addition to proper N fertilization, it may be prudent to supply turfgrass with additional phosphorus (P) and potassium (K). Anecdotal evidence suggests that applications of P and K may suppress large patch development. Limiting the duration of leaf wetness (dew period) is important for almost all foliar diseases. Various experienced turf managers favor different irrigation times. A good rule of thumb is to avoid irrigation at times (late afternoon and early evening) that contribute to an increase in the length of the dew period. For RLP, this is especially important during summer months. Additionally, summer aeration can help limit symptom expression by reducing thatch and increasing water infiltration into the soil.

Control with Fungicides

Acceptable RLP control can be achieved with effective fungicides if they are applied at the appropriate times. Results of our trials show that the strobilurin fungicides (Heritage[®], Compass[®], and Insignia[®]) provide excellent control. Flutolanil (Prostar[®]) affords equally exceptional control. Results of fungicide with DMI fungicides (Banner



Figure 4



Figure 5



Figure 6

Maxx[®], Bayleton[®], and Eagle[®]) were mixed, and they generally are considered less effective than flutolanil and strobilurins. PCNB products (Turfcide and others) are only marginally effective and run the risk of phytotoxicity to actively growing turf. Timing is equally important for optimum levels of control. Using effective fungicides, a single application in the spring (prior to 50 percent green-up) gave superior patch suppression in our experiments. Fall applications (a single spray made about four weeks prior to the expected first frost) also were effective. Midsummer applications stopped the spread of disease, and turf quality began to improve, but levels of control were not comparable to those with spring or fall applications.

Help For The Home Lawn

The approach to managing Rhizoctonia large patch in home lawns is similar to that used on golf turf north of the transition zone. Fertilizing with a maximum of two pounds of N per 1,000 square feet per year applied between May and mid-August, along with frequent aerification and power raking to minimize thatch, may lessen damage caused by RLP. However, if several rapidly expanding patches have already developed, it may be necessary to contract a lawn care company to apply one of the fungicides mentioned above during the spring, prior to 50 percent green-up.



Figure 7



Figure 8

All photos by Richard Latin.

