

Large Patch of Zoysiagrass and Bermudagrass

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Zoysiagrass and bermudagrass are commonly grown warm-season grasses on home lawns, golf course fairways and business landscapes in Arkansas. Also, a considerable amount of zoysiagrass and bermudagrass sod is produced in the state. In general, zoysiagrass is an easily maintained turfgrass, but susceptibility to large patch can cause a serious problem under Arkansas fall and spring conditions. Although bermudagrass is susceptible to large patch, the disease is less frequently observed and less damaging to bermudagrass than on zoysiagrass.

Cause

Rhizoctonia solani AG 2-2 (LP), a fungus.

Symptoms

Large patch appears in the fall and spring as circular, discolored patches that expand over time (Figure 1). The fungus is more active during periods of moderate temperatures (68-77°F) and higher moisture. The disease is especially severe in poorly drained areas. Generally, patches begin to appear in the fall as zoysiagrass approaches winter dormancy and when soil temperatures decline below 70°F.

Patches start as circular, tan-colored areas. At times, the borders of the patches will be orange, which indicates that the disease is active.

Figure 1



The orange discoloration symptom is also known as “firing.” The orange border consists of newly infected plants where the lower leaves are just starting to die as the fungus invades and kills the leaf sheath below the blades.

The grass and the disease are dormant during the winter, but diseased areas are more sensitive to cold injury. As the turfgrass begins to break winter dormancy in the spring, the infected areas from the fall are often prominent, and the tan patches contrast against the greening turfgrass. Once soil temperatures climb above 50°F, the pathogen becomes active again and can begin to re-infect the grass leading to expansion of the disease in the spring.

The dead-looking centers of the patches will appear thin and sunken and may be invaded by weeds. Patches vary in size and shape but tend to be circular and may reach 20 feet in diameter. Disease progress

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slows as temperatures rise during the spring, and the patches gradually become filled in by new growth during the late spring or summer. Once soil temperatures are high enough for zoysiagrass and bermudagrass to grow optimally, they will out-compete the pathogen and recover from symptoms. If not controlled, patches tend to return each fall and spring in the same places.

Disease Cycle

The large patch fungus survives hot weather in infected nodes where leaf sheaths have rotted off in infested thatch. The fungus becomes active in the early fall as temperatures cool and zoysiagrass slows growth in preparation for winter dormancy. As the disease develops once soil temperatures drop beneath 70°F, the zoysiagrass and bermudagrass are no longer able to outcompete the pathogen. When the turfgrass enters winter dormancy, the pathogen overwinters in the thatch, and then the pathogen will re-infect the turfgrass during spring green-up.

The disease progresses outward in all directions from the initial point of infection, killing leaf sheaths and leaves and creating a roughly circular patch. Depending on conditions, some leaves within the patch may survive, and the disease is not known to kill stolons or roots. Once the disease is suppressed by high temperatures, stolons will form new shoots and the patch will start to recover and eventually disappear during the summer. The disease is more severe on zoysiagrass that has been mowed at less than 1-inch height. Because the fungus survives during the summer in thatch and grass, anything that moves this material will scatter the fungus around. Mowing, aerating and sod transplanting all move the fungus to new areas.

Disease Control

Large patch is made worse by close mowing, overwatering and excessive early- or late-season nitrogen applications. Any successful control program will have to address these issues.

Control practices include:

- Improve drainage to avoid soil saturation.
- Do not overwater the grass, especially in the fall or spring.
- Mow as tall as practical.

- Bag and remove clippings from patch areas because they may spread the disease.
- Avoid mowing when the turfgrass is wet.
- Do not core aerate or verticut during the spring when large patch is active because this spreads the disease. These practices should only be done to reduce thatch and stimulate the turf during the summer months when large patch is inactive.
- Do not apply nitrogen fertilizer to zoysiagrass or bermudagrass in early spring. Wait until warm weather has slowed large patch development (usually May).
- Do not use more than 2 pounds per 1,000 square feet actual N per season on zoysiagrass or more than 4 pounds per 1,000 square feet on bermudagrass.
- Use slow-release nitrogen fertilizers during the summer.
- Use a quick-release N source, like urea, as the first N application in May to speed patch regrowth in early summer.
- Discontinue nitrogen applications after August 15.
- If a blanket fungicide application is not feasible, it is beneficial to apply fungicide to areas with a known large patch problem. Initial fall fungicide applications should be made when five-day average soil temperatures from 0-4 inches drop below 70°F.
- One to two spring fungicide applications may be necessary. Applications should be made during spring green-up when 5-day average soil temperatures from 0-4 inches are consistently above 55°F.
- Fungicide applications after patches start to develop are much less effective than preventive applications.
- Read and follow all fungicide labels.

For homeowners with large patch in their lawns, try the cultural controls listed above, and if these do not control the disease, then contact a professional lawn service about applying a fungicide at the proper time.

Table 1: Fungicide efficacy rankings against large patch.

FUNGICIDE EFFICACY	
EXCELLENT	
flutolanil metconazole PCNB tebuconazole triticonazole triadimefon	
GOOD	
azoxystrobin fluoxastrobin fluxapyroxad penthioopyrad propiconazole prothioconazole pyraclostrobin	
FAIR	
iprodione myclobutanil polyoxin D	

Acknowledgments: Dr. Stephen Vann, Dr. Gene Milus and Dr. Rick Cartwright were the original authors of this fact sheet. The listing of any product in this publication does not imply endorsement of that product or discrimination against any other product by the University of Arkansas Division of Agriculture. Every effort was made to ensure accuracy, but the user of any crop protection product must read and follow the most current label on the product – The Label is the Law. For further assistance, contact the local Cooperative Extension Service office.

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FSA7527R-PD-5-2024

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