

The Plant Doctor

Large (Brown) Patch *of Warm-Season Turfgrasses*



Large (Brown) Patch

Most common seasons

Spring and fall, when turf is emerging from or entering dormancy.

Weather

Cool nights, warm days with rains or heavy dews.

Turf types affected

All warm-season turfgrasses, including St. Augustinegrass, centipedegrass, bermudagrass, and zoysiagrass

Quick symptoms

Brown, round patches in the lawn; leaf tips brown or red.

Quick Symptoms and Background

Large patch is the most common lawn disease in Mississippi during the spring and fall. It is characterized by circular patches with brown or smoky gray outer edges. The circular patches may continue to grow to 20 feet or more in diameter and may intersect other patches, creating complex patterns (**Figure 1**). In larger patches, the inside of the patch may begin to turn green again. The patches often occur at the same location year after year, usually in low areas or where dew or moisture stays for longer periods, such as shaded areas.

This disease is caused by a fungus, *Rhizoctonia solani*, which also causes diseases of many agricultural and horticultural crops. The fungus is actually a weak pathogen of warm-season turfgrasses, attacking them during emergence from or entering into winter dormancy, when they are at their weakest. This is why large patch of St. Augustinegrass, centipedegrass, bermudagrass, and zoysiagrass (warm-season turfgrasses) is most common in the spring and fall, and is usually not active during the summer, when the warm-season turfgrasses grow best. This disease has been called many names, including “large patch,” “large brown patch,” “brown patch,” and “Rhizoctonia brown patch.”



Figure 1. Late spring symptoms of large patch. Note circular patches (toward the top of the photo), and patches that have merged (toward the bottom of the photo).



Figure 2. A St. Augustinegrass lawn with actively growing large patch. Note the "cinnamon" brown color around the outside edges of the patches. This color is characteristic of an actively growing patch.

The *Rhizoctonia solani* fungus also attacks cool-season turfgrasses, such as tall fescue, bentgrass, and ryegrass, but these plants are weakest in our summer heat, so it is a summer disease on them. As you might guess, the disease symptoms are different on cool-season grasses than on warm-season turfgrasses. This publication discusses the disease caused by *Rhizoctonia solani* on warm-season turfgrasses.

Disease Cycle and Symptoms

While the fungus *Rhizotonia solani* is present all year in the soil, certain conditions are needed for disease to occur. Extended dew periods, rains, or excessive irrigation must be present because the disease is often worse in low, wet areas. Relatively cool temperatures (60 to 75 °F) facilitate the disease while the cool nights and warm days typical of spring or fall may prolong it. At temperatures of 75 °F and above, and under low moisture conditions, the activity of the fungus decreases. High nitrogen fertility, especially in response to early fertilizer applications, increases turf susceptibility to the disease. A weak host, such as a warm-season turfgrass emerging from and entering winter dormancy, favors infection.

The first symptom of large patch most people notice is one or more circular, light green patches that may range in diameter from 2 inches to about 2 feet. These will usually start where patches have grown in previous years, in low areas, or in areas where dew and moisture presence is increased. The patches grow from the center outward and may spread rapidly or slowly, depending on moisture and temperature conditions. Patches grow as long as conditions are favorable and may spread out 20 feet or more. A green recovery may be seen in the centers of some of the greater large patches. In the

fall, patch borders are usually brownish to gray. In the spring, as the grass starts to grow and if the weather remains wet and mild, the patch may turn yellow, gray, and then brown. The color of the outside edge of an actively growing patch is usually a cinnamon brown (Figure 2).

The fungus begins its attack at the base of leaf sheaths where the leaves attach to the rope-like stolon (Figure 3). The base of the leaves turns dark brown to almost purple and is soft when conditions are moist and the disease is active. In the absence of moisture, the base will turn tan or reddish-brown and harden. Because the base of the leaf is rotting, the flow of moisture and minerals to the upper leaves is cut, and the top of the leaf turns color before dying and turning brown.



Figure 3. Diseased St. Augustinegrass plants. The green, cylindrical stolon is just submerged in the soil and runs from right to left. The plants grow off the stolon. The fungus secretes enzymes that digest plant material from the outside in. The outside of the plant tissue starts to decay, and eventually the decay severs the water-conducting tissue inside the plant. The flow of water and nutrients to the leaves of the plant on the left have been severed and the leaves turned brown, but are still moist from the decay and the weather. The basal (crown) area from which the leaves emerge from the stolon on the right-hand side plant, is decaying (wet brown color of the vertical "stem" portion emerging from the stolon). The lowest leaf has fallen off, leaving a horizontal scar across the crown. The next leaf up (left side of the right-hand plant) has turned entirely brown and the other leaves show some symptoms of water deprivation. The center leaf had turned the characteristic yellow of infected St. Augustinegrass, but the infection has been so active that it is seen as more brown than yellow where it emerges above the area where the other leaves cover it and the top of the leaf is starting to dry.

The upper leaves of St. Augustinegrass will generally turn yellow, whereas the upper part of centipedegrass leaves turn reddish before dying. Centipedegrass and zoysiagrass recover more slowly from large patch than bermudagrass. St. Augustinegrass is in between. In general, the more severe the patch, the longer the recovery. Turf can be so damaged that you may be able to see the outline of the patch most of the year, even though the pathogen is not active.

One test to confirm the disease is to walk to the edge of the patch and pinch the tip of a symptomatic grass leaf and gently tug. The leaf should come off in your hand and the base should be brown to tan if the disease is large patch. Try this with multiple leaves around the outside of the patch.

If the leaves and stolons come up together, you might have take-all root rot (see Publication 2384 *The Plant Doctor: Take-all Disease of Turfgrasses*). If the plant and roots but no stolons come up, you may have anthracnose. Both of these diseases are typically found during hot weather.

You can have the disease professionally diagnosed and receive a full report and recommendation for a small fee (see M1230 *MSU Extension Plant Disease and Nematode Diagnostic Services*). Collect a 4-by-4-inch sample, including 2 inches of soil and roots, from the edge of the disease area, where it fades to the healthy turf. Wrap the sample in dry newspaper, place it in a plastic bag, box it, and send the box to 190 Bost North, Room 9 Stop 9612 Mississippi State, Mississippi, 39762-9612. Make the check out to MSU-ES. Results are usually available within 3 to 7 days of receiving the sample.

Prevention is the best method of disease control. To prevent large patch or other lawn diseases from developing, practice the following disease-control procedures.

- Use varieties adapted for your area (see Publication 1322 *Establish and Manage Your Home Lawn*).
- Manage your lawn properly by using recommended practices for watering, mowing, fertilizing, and removing thatch (see Publication 1322 *Establish and Manage Your Home Lawn*).
- Too much nitrogen fertilizer (water-soluble nitrogen sources) promotes a lush turf that is readily attacked by many plant diseases, including large patch. Because of television advertising campaigns, many fertilize their lawn too early and are encouraging the large patch disease. See Publication 1322 *Establish and Manage Your Home Lawn* for more guidance on fertility and fertilization, but a general rule of thumb is that you should not fertilize until you have mowed your

warm-season turfgrass lawn at least twice. Earlier fertilization will feed more weeds than grass and also make large patch worse.

- Watering late in the afternoon or mid-morning lets the grass remain wet for long periods of time, encouraging disease development. Water infrequently and at times that do not extend the leaf wetness period (see Information Sheet 1670 *Watering and Plant Disease*).
- Thatch is the buildup of grass and plant debris in the root and crown areas of the turf. Too much thatch creates a favorable environment for the growth of many disease-causing fungi and, at the same time, an unfavorable environment for turf plants. Large patch has been observed as late as mid-July in heavily thatched St. Augustinegrass lawns that are overwatered. Thatch gives the lawn a spongy feeling. If you can wiggle your finger through more than a half-inch of grass before contacting the soil, you probably have too much thatch.
- If your lawn has a history of large patch, then you must be proactive in preventing its development. In the spring, watch the weather conditions, and when warm days are followed by cool nights and the grass is just starting to green, apply a fungicide to and around the areas where large patch has occurred before. Follow label directions for repeat applications until you have mowed the lawn twice. In the fall, when the forecaster announces the first cool evenings of the season, apply a fungicide to the same areas. Again, follow label directions until the turf enters dormancy. Applications in both the spring and fall may be spaced further apart during dry weather, and must be closer during wet weather.
- Because the disease is near the soil, apply liquid fungicides in enough water to equal 3 gallons of water per 1,000 square feet. This will carry the fungicide into the area of the plant that can best absorb it and best fight the disease.
- There are three active ingredients for residential use readily available in garden stores and co-ops. Two of the active ingredients are members of the same class of chemistry. A 2010 trial showed that one of these, myclobutanil (both granular and liquid formulations) burned turf in temperatures higher than 80°F. The other, propiconazole, was not in the trials, but it has been reported to cause similar burns when it is used on warm-season turf at similar temperatures. These products are:

1. Myclobutanil. Sold as Fertilome F Stop (0.39% granular, 8-pound bag), Fung-Away Systemic Lawn Fungicide (granular, 10-pound bag), Spectracide Immunox Lawn Disease Control Granules (0.39% granular, 10-pound bag), and Spectracide Immunox Multi-Purpose Fungicide Spray Concentrate (1.56% liquid).
 2. Propiconazole. Sold as Bayer Advanced Fungus Control for Lawns (0.51% granular or a 2.42% ready-to-spray), Bonide Infuse Systemic Disease Control (1.8% liquid or ready-to-spray), Fertilome Liquid Systemic (1.55% liquid), and Monterey Fungi-Fighter (1.55% liquid).
- The third active ingredient is a granular formulation of azoxystrobin. This is sold in a 10-pound bag as Scotts Disease EX Fungicide or in a 30-pound bag as Heritage G. Both are labeled at 2 pounds of product per 1,000 square feet for preventive usage and 4 pounds for curative usage. Heritage G can be purchased and used by residential owners (it is not a restricted-use fungicide, nor is it only for professional use), but it is used by professionals. Because this product is mostly used by professionals, it is not generally carried by garden stores and must be ordered.

The information given here is for educational purposes only. References to commercial products, trade names, or suppliers are made with the understanding that no endorsement is implied and that no discrimination against other products or suppliers is intended.

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