

Turf Patch Diseases

Robert J. Mugaas, extension educator, Hennepin County Extension Office,
and Ward C. Stienstra, professor, Department of Plant Pathology

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Symptoms and Pathogens Involved

The symptoms of Patch Disease damage are not in themselves diagnostic. Many turf problems result in circular dead areas or rings of dead grass with live grass in the center. A common term for "patch" problems was Fusarium Blight. However, the terms Necrotic Ring Spot (*Leptosphaeria korrae*), Yellow Patch (*Rhizoctonia cerealis*) and Summer Patch (*Magnaporthe poae*), are more definitive and appropriate when discussing these problems. These fungi are difficult to isolate from infected roots and laboratory confirmation can require many months.

Symptoms typical of patch diseases include leaf color change from healthy green to tan-brown with the leaves often exhibiting a reddish color as they die. This reddish color is an early symptom that may not be seen, and only leaf death is reported. The dead grass is usually in rings or circular patches (**Figure 1**). However, streaks or incomplete rings can also be found. Damage symptoms can persist for several years, and new symptoms may develop for several years.



Figure 1. Patch disease symptoms.

These fungi are soil inhabiting organisms favored by wet conditions in the spring and fall. The fungi are believed to be widespread in our soils and highly dependent on temperature and moisture conditions. Cooler soils favor *Rhizoctonia*, while warmer soils favor *Magnaporthe*, and intermediate temperatures allow for the development of *Leptosphaeria*.

These diseases attack grass root systems and crowns resulting in dark colored and rotted roots and crowns. Spread of the fungi is favored by thick lawns with many grass plants growing very

close together. The fungi easily grow along and in the root systems moving from plant to plant and into the crown. Wet periods followed by warm dry conditions can bring on severe symptoms. Infected plants often die during even slight dry periods as they have no root systems to support them.

Site Conditions

Site conditions can play a role in the occurrence of these diseases. One of the more significant contributors is excessive soil compaction. Compacted soils retard or prevent the establishment of root growth into the existing soil. Turf is weakened as a result of soil water logging and increased thatch buildup.

An inch or two of "topsoil" laid over a compacted soil results in soil layering that causes many of the same effects as described above for compacted soils. Soil preparation should include working any topsoil into the existing soil. This creates a more uniform, deeper rootzone, potentially adds some organic matter, and relieves some of the soil compaction. Just prior to preparing the soil is a good time to have a soil test done such that any additional phosphorus (P) and potassium (K) can be added during the preparation process. Potassium levels are often in the low to moderate range, especially in disturbed soils such as found in new construction areas. Potassium is associated with general turfgrass vigor and stress tolerance. A reliable soil test will indicate amounts of P and K needed.

Thatch Management

Thatch is a layer of partially decomposed grass stems, roots, crowns and rhizomes on top of the soil and below the green leaves. This is a natural development of healthy, vigorous turf, but layers greater than 1/2 inch can cause problems. An excessive thatch layer inhibits root growth deeper into the soil, thus limiting access to additional soil water and nutrients. Excess thatch can directly inhibit water and nutrients from entering the soil. The thatch layer can be a location for fungi to live, overwinter, grow and attack the turf. Excess thatch build-up is related to the specific species or variety of turfgrass and an environment that does not favor thatch breakdown.

Primary thatch reduction practices for lawns include aeration and/or vertical mowing. Equipment for mechanical removal can be rented, or lawn service companies can perform the work. Spring and late summer are good times for mechanical thatch reduction. However, a severely thatched lawn can be treated anytime. Aeration and vertical mowing treatments cause damage to existing grasses and, when done during warm and dry periods, one must give careful attention to watering after the treatment. A vertical mower should be set to penetrate the thatch layer down to the underlying soil. This will remove some thatch and lift a small amount of soil to the surface.

Aeration removes less thatch directly but hastens microbial decomposition by bringing soil and thatch directly into contact. The aeration treatment, while it does not directly remove as much thatch, promotes microbial thatch decay for a longer period. It also reduces soil compaction, increases water and nutrient penetration, and stimulates root development. Remember, severely thatched lawns and compacted soils are common co-problems. Aeration may be required two or more times in a single season with multiple passes over the lawn at each treatment. On heavy soils, such as clay or clay loams, regular aeration is necessary to prevent soils from becoming compacted.

Topdressing, the uniform spreading of a thin layer of soil over a grass area, can reduce thatch. The soil organisms present in the topdressing material begin the decomposition of thatch. The application of topdressing materials or commercial thatch decomposition products do not improve soil structure as does aeration. Thatch removal products and topdressing are the least effective treatments. Mechanical removal of thatch is not complete in one treatment, and microbial breakdown is a process that requires time. The best treatment for turf with compacted soil and a thatch layer is aeration.

Fertilization

Excess use of nitrogen fertilizer in the spring and during hot weather should be avoided, especially when trying to reduce symptoms associated with patch diseases.

Fertilize with 1 pound of actual nitrogen per 1000 square feet in late summer (September 1-15) and again when grass growth rate slows, **but before ground is frozen**. Spring applications of nitrogen can be reduced or eliminated when late season treatments are applied. Applications of nitrogen, when needed to keep the grass growing actively, should be limited to 1/2 pound per 1000 ft² per application in May through August. Fertilizers containing iron or separate iron fertilizer supplements should be considered in the early part of the growing season to provide the desired green appearance rather than applying extra nitrogen.

Since summer moisture stress is often associated with summer patch development, proper watering is critical. Lawn watering once a week to a depth of 6 inches to encourage deep rooting and healthy grass is not a good recommendation for lawns with short, restricted root systems. Since the fungus may have eliminated most of the root system, water at a depth of even 3 inches is not benefiting the grass plant. What is required is frequent light waterings to keep the top 1/2 to 2 inches of soil moist. As the lawn begins to recover, *gradually* lengthen the time between waterings and apply more water each time until back to a normal watering program. Be sure to monitor automated irrigation systems such that they do not keep the soil and thatch excessively wet, especially during the spring and fall periods. As fall periods can be cool but dry, maintain adequate irrigation throughout the fall period to keep the grass healthy going into the winter.

Watering during the heat of the day is not harmful and even required for cooling the lawn, preventing water stress and associated patch symptom development.

Mowing

While managing a lawn with patch disease problems, mowing heights should be adjusted higher during the recovery period. This will allow the potential for greater rooting depth and consequently more soil volume from which the roots can draw moisture and nutrients. This is particularly important during periods of drought stress. Removing about 1 inch of the grass height at any one time will help minimize plant stress.

Overseeding

Overseeding an existing lawn is usually of limited value. The chances of achieving good seed-to-soil contact by broadcasting seed over the surface of an existing lawn are minimal. A greater degree of success can be achieved by either topdressing or thoroughly core aerating the lawn

prior to overseeding (**Figure 2**). This will promote seed-to-soil contact that is essential for germination and seedling development. Select a good quality blend of bluegrasses along with a small amount of improved perennial ryegrass. A mixture of grass types results in a more disease-tolerant lawn.

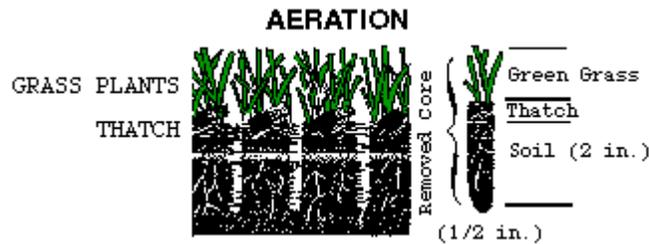


Figure 2.

Re-sodding severely infected lawns has often resulted in the disease returning and again quickly damaging the new sod. Thus, replacing sod in the affected areas may only temporarily mask the symptoms and not treat the cause.

Fungicides

The application of fungicides should only be done in a management program inclusive of the above suggestions. Curative response to fungicides has been variable and in some trials the response to management changes was just as effective. Preventative fungicide application to sites with a history of the disease can be effective when first applied mid April to early May and repeat applications (one or two) are made at 3 to 4 week intervals. Fungicides are not a substitute for improved cultural practices.

Robert J. Mugaas
Hennepin County Extension Office
Ward C. Stienstra
Plant Pathology

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