UNIVERSITY OF KENTUCKY College of Agriculture, Food and Environment

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF KENTUCKY COLLEGE OF AGRICULTURE, FOOD AND ENVIRONMENT

Plant Pathology Fact Sheet PPFS-OR-T-06

Patch Diseases in Kentucky Bluegrass Lawns

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Introduction

"Patch diseases" can be very destructive when Kentucky bluegrass is grown under intensive management. Two patch diseases with similar symptoms can occur. Necrotic ring spot often appears in early summer. Summer patch, the more common disease in Kentucky landscapes, develops in middle to late summer.

These diseases are often a concern in lawns under intensive management for two reasons:

1. Improper application of certain lawn management practices, such as close mowing, can aggravate disease development.
2. When a lawn receives significant inputs of fertilizer and irrigation and frequent mowing, the homeowner or landscape manager usually has high aesthetic expectations and tolerates little turf damage.

Symptoms

Both patch diseases produce similar symptoms in Kentucky bluegrass. The timing of symptom development is a good way to distinguish these diseases.

Necrotic Ring Spot

Symptoms of this disease usually appear during the last week of May or the first few weeks of June, particularly if dry conditions prevail at those times. The disease appears first as bluish-green wilted grass in patches 6 inches to 3 feet in size. These patches quickly become brown as the wilted grass dies (Figure 1). Often, a tuft or patch of healthy turf is present in the center of affected patches, giving the turf a "donut" or "frog-eye" appearance (Figure 2). Below ground, roots of affected tillers have a light brown to dark brown decay.

Figure 1. Distinguishing between necrotic ring spot and summer patch can be difficult since these diseases produce similar symptoms; however, timing of symptom development is a helpful diagnostic tool. Necrotic ring spot, which occurs in early summer, is pictured here.

Symptoms are most severe in the driest parts of the landscape, such as on knolls or slopes. Although symptoms of necrotic ring spot generally develop in early summer, they can persist throughout summer until cool weather allows the turf to begin to recover.

FIGURE 2. NECROTIC RING SPOT. A TUFT OR PATCH OF HEALTHY TURF IS OFTEN PRESENT IN THE CENTER OF AFFECTED PATCHES, GIVING THE TURF A "DONUT" OR "FROG-EYE" APPEARANCE. **FIGURE 3.** SUMMER PATCH. CIRCULAR OR CRESCENT-SHAPED DEAD PATCHES ARE TYPICAL OF THIS DISEASE. TUFTS OR PATCHES OF HEALTHY TURFGRASS OMETIMES APPEAR IN THE CENTER OF THE PATCHES.

Summer Patch

Circular or crescent-shaped dead patches (FIGURE 3) measuring a few inches to 2 to 3 feet appear from late July through August. When the disease is most active, the margins of affected patches can have a slightly bronze color as the plants die. This bronze color is evidence of active disease progress. Tufts or patches of healthy turfgrass tillers sometimes appear in the center of the patches, although not as commonly as with necrotic ring spot. Individual dead plants are characterized by a dry, dark brown decay of the roots, which can progress into the crown. Patches can blend together over large areas of turf when the disease is severe, which makes recognition of the characteristic patches difficult. Bare spots remain in the turf until the grass recovers in early autumn or the following spring.

CAUSES & DISEASE DEVELOPMENT

Until the early 1980s, the patch diseases of Kentucky bluegrass were collectively known as "Fusarium blight." Turf pathologists now recognize that symptoms of patch diseases during middle to late summer on most Kentucky bluegrass lawns are not due to *Fusarium* fungi infecting crowns, but to root-infecting fungi. In addition to bluegrasses, certain fine-leaved fescues are susceptible to these diseases.

The fungi that cause necrotic ring spot and summer patch infect and rot roots. Root rot causes plants to lose the ability to supply water and nutrients from the soil to the leaves.

Necrotic Ring Spot

Root-rotting activity by the fungus that causes this disease, *Ophiosphaerella korrae*, is greatest during cool, wet weather in late April and May. Aboveground symptoms become apparent as warm, dry weather in early summer puts stress on tillers with root rot. Symptoms of necrotic ring spot often are most severe in areas where the soil dries out. Compaction can increase the severity of necrotic ring spot by reducing root development.

Summer Patch

The fungus that causes this disease*, Magnaporthe poae*, actively infects roots in warm (77-86°F), wet soils. Thus, frequent rainfall and/or irrigation during July and August leads to severe root rot. Symptoms develop above ground when roots are unable to supply adequate water to leaves during hot weather, causing plants to wilt and die. These symptoms may develop during temporary drought conditions. However, it is important to recognize that root infections develop for weeks prior to the occurrence of symptoms above ground.

Management conditions that favor development of summer patch include: close mowing, light and frequent irrigation, high nitrogen fertility during spring or summer, excessive thatch accumulation, and soil compaction.

Other Causes of Dead Patches

Not all dead patches in Kentucky bluegrass appearing during summer are necrotic ring spot or summer patch disease. There may be other causes for similar symptoms, including localized dry spot. This condition is not an infectious disease, but rather a condition where patches of soil become hydrophobic and repel water, even when rainfall is adequate. Grass plants in these patches suffer from drought stress. Check the soil for evidence of dryness following rainfall or irrigation.

Disease Management

No single measure controls patch diseases. Integrate as many of the following practices as possible to obtain best control.

Selection of Resistant Varieties or Species

Planting a Kentucky bluegrass variety that has performed well in University of Kentucky field tests (see Additional Resources) is highly recommended when establishing a new lawn or overseeding an established lawn. Necrotic ring spot and summer patch both occur naturally at the UK test site in Fayette County, and nearly 150 Kentucky bluegrass varieties been evaluated for their reactions to patch diseases under Kentucky conditions over several years. There have been striking differences in the way varieties react to the patch diseases. No Kentucky bluegrass variety is immune to patch diseases, but disease development can be reduced greatly in the best varieties. The disease management practices described below are still important when using these varieties.

Another option is to inter-seed perennial ryegrass into areas affected by the patch diseases. Perennial ryegrass establishes easily and is not affected by either disease. Renovation of a lawn with tall fescue is also an effective way to eliminate patch disease problems. Like perennial ryegrass, tall fescue is not affected by either patch disease.

Mowing Height

Necrotic Ring Spot

The effect of mowing on this disease has not been studied. Close mowing is known to lead to restricted root development in turfgrasses, and plants with restricted root systems are more vulnerable to root rot diseases. Thus, close mowing may aggravate this disease.

Summer Patch

Close mowing has been shown to aggravate summer patch. Kentucky bluegrass lawns are normally mowed between 2 and 3 inches. Keep a relatively high mowing height in lawns where summer patch develops. Raising the mowing height promotes healthier turf with better root development and higher levels of nutritional reserves needed for stressful periods.

Irrigation

Necrotic Ring Spot

Probably the most practical way to deal with this disease in many lawns is to manage the turf so that it can better tolerate the disease. Irrigating turf lightly and frequently is normally discouraged because it can intensify a number of turf diseases. However, in sites where necrotic ring spot is the principal problem, irrigating lightly and frequently often helps keep the turf somewhat healthy.

Summer Patch

In contrast to management for necrotic ring spot, lawns where summer patch is the principal disease should not be irrigated lightly and frequently during the summer. *M. poae* is most active in warm, wet soils. A combination of close mowing and light, frequent irrigation can intensify this disease substantially. If summertime irrigation is needed, the soil should be moistened to a depth of 3 to 4 inches and allowed to dry out between irrigations. Check the watering depth by pushing a metal rod or screwdriver into the soil. It will sink easily until it reaches dry soil. To determine when to irrigate again, step on the grass—if it fails to spring back up, consider irrigating.

Fertility

Cool-season grasses, like Kentucky bluegrass, should receive all or at least two-thirds of their

yearly nitrogen fertilizer during autumn and early winter. Heavy nitrogen fertility during spring or summer can promote development of patch diseases.

Necrotic Ring Spot

During periods when aboveground symptoms occur, light applications of nitrogen fertilizer can help the turf tolerate root infections of *L. korrae*. Slow-release forms of nitrogen fertilizer have been shown to reduce disease severity and may be useful in sites with serious problems with necrotic ring spot. Certain organic fertilizers, containing such things as feathermeal, bonemeal, and soybean meal, reduced severity of necrotic ring spot in some experiments. However, control of the disease with these types of products has been poor in other well-conducted field tests. Thus, homeowners and landscape managers should not rely on organic fertilizers for control of necrotic ring spot.

Summer Patch

Regular use of ammonium sulfate, ammonium chloride, or sulfur-coated urea as a nitrogen source can reduce the severity of summer patch. Avoid nitrate-containing fertilizers for these sites. A long-term fertilization program with ammonium fertilizers or sulfur-coated urea can increase the acidity of the soil (lower the soil pH), which creates an inhospitable soil environment for *M. poae*. This effect is probably not as pronounced in high-clay soils or soils receiving a great deal of irrigation each season, but it may be beneficial in many Kentucky landscapes. If the lawn receives fertilizer during hot weather, choose a fertilizer with low burn potential, such as sulfur-coated urea.

Fungicides

Use of fungicides for control of patch diseases in lawns and landscapes is discouraged. Adequate control usually is achieved with proper cultural practices. Overseeding affected areas with perennial ryegrass or renovation with a better variety of Kentucky bluegrass or with tall fescue are effective ways to deal with persistent problems with patch diseases. There are a number of concerns with fungicide use in home lawns and landscapes. One problem is that repeated applications of high rates of fungicides are usually needed for patch disease control. These fungicides are expensive and will not cure the disease, but merely suppress it temporarily. If the lawn requires repeated use of fungicides to maintain acceptable quality, this usually indicates the turf species or variety should be changed.

For those interested in fungicidal control of patch diseases, the UK Extension Publication *Chemical Control of Turfgrass Diseases* (PPA-1) provides information of interest. Avoid repeated use of fungicides containing chlorothalonil or iprodione because these have been shown to enhance the severity of summer patch.

Additional UK Resources

Chemical Control of Turfgrass Diseases, PPA-1
http://www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf

Recommended Kentucky Bluegrass Varieties
http://www.uky.edu/Ag/ukturf/kbg.html

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