

Turfgrass Disease Profiles

Summer Patch

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Summer patch affects Kentucky bluegrass and annual bluegrass on all kinds of turf venues, including golf courses, athletic fields, professional landscapes, and residential lawns. The summer patch pathogen, *Magnaporthe poae*, is active during the summer, when turfgrass roots grow very slowly.

The pathogen attacks and colonizes roots and crowns during periods of environmental stress and limited root growth. As a result, infected plants often die, leaving patches of dead turf. Summer patch can be particularly severe on golf greens containing moderate to high proportions of annual bluegrass. Turf killed in midsummer adversely affects playability and ruins turf's aesthetic appearance.

Summer patch symptoms begin to appear during the heat of summer because infection-impaired roots cannot keep plants alive during periods of heat and drought stress. Initial symptoms resemble small (4-6 inches in diameter) circular or oval patches with an orange-brown color and often occur in clusters (Figure 1). Individual patches expand to more than 12 inches in diameter. After initial disease establishment, patches enlarge in a radial fashion. Most turf damage occurs at the leading edge of the patch. Areas in the center of a patch may fill in with creeping bentgrass, particularly on golf greens (Figure 2), or other turf species in Kentucky bluegrass stands. In turf stands where the disease has been established for several years, the infected areas have field patterns that resemble frog eye patches or arcs and rings of damaged turf (Figure 3). Plants with



Figure 1

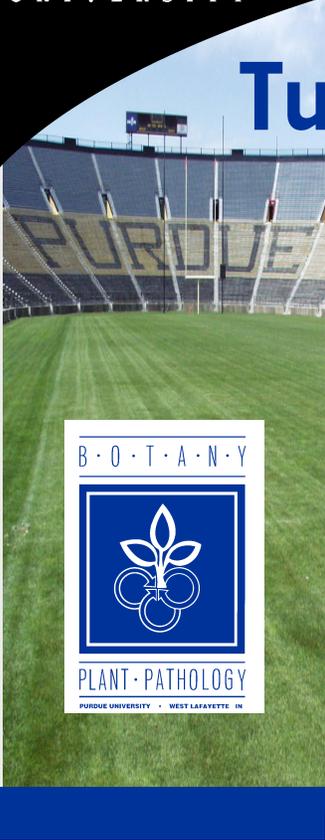


Figure 2



Figure 3

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



moderate to severe infection will exhibit a characteristically sparse and necrotic root system (Figure 4).

Infection by the summer patch pathogen is highly dependent on the temperature and moisture status of the soil. When soil temperatures are elevated (75-85°F) and there is ample soil moisture, the summer patch pathogen readily infects and colonizes turf roots. At these temperatures, root growth is slow and no new roots will be initiated until fall. By midsummer, plants with even moderate levels of infection will succumb to heat and drought stress due to impaired root systems.

The summer patch pathogen survives in infested turf debris and in infected root and crown tissues. While the pathogen naturally occurs in many types of soils, it also may be transported to unaffected areas with maintenance practices that involve moving soil with contaminated roots or root debris (primarily aerification).

Disease Control

Resistance to Disease

Reasonable progress has been made in the development of Kentucky bluegrass varieties with good resistance to summer patch. Varieties such as America[®], Blacksburg[®], Classic[®], Eclipse[®], SR2100[®], and SR2109[®] have performed well in Midwest trials. A comprehensive list of Kentucky bluegrass varieties and their performance in a battery of trials is available on the National Turfgrass Evaluation Program (NTEP) Web site, www.ntep.org.

Cultural Practices that Suppress the Disease

Because extensive summer patch outbreaks are associated with severe heat and drought stress during the summer, cultural practices that relieve such stresses will minimize disease damage.

Summer stress relieving practices include:

- Core aeration or deep tine aeration in the fall and spring. This promotes deep rooting, resulting in healthier turf that's less prone to infection and more tolerant of summer stresses despite mild, or even moderate levels of infection.
- Prolonged (deep) infrequent irrigation.
- Syringing to cool turf on hot afternoons.
- Redirecting traffic to minimize damage and compaction.

Chemical Control Options

Fungicides may be effective in reducing the severity of a summer patch outbreak. Only acropetal penetrant



Figure 4

fungicides are recommended since they seem to possess sufficient solubility to reach roots in thatch and perhaps the top few millimeters of soil. Such fungicides include thiophanate-methyl (Cleary's 3336F[®]); DMI products such as propiconazole (BannerMaxx[®]), triadimefon (Bayleton 50W[®]), myclobutanil (Eagle 20EW[®]), and fenarimol (Rubigan[®]); and one strobilurin (Heritage 50WG[®]).

Because these fungicides are expensive, several factors should be considered before implementing a chemical control program. Summer patch is a root disease and very little fungicide will find its way underground. Aeration (even solid tine) prior to spraying, and irrigation before and after application, may enhance fungicide performance by improving the likelihood that effective levels of fungicide will reach the target zone.

Also, initial application timing is critical. Fungicides must be applied when the pathogen is active. And soil temperatures define that activity. A rule of thumb developed by New Jersey scientists advises fungicide application only after maximum daily soil temperatures at a 3-inch depth average 65°F or higher for several consecutive days. Fungicide sprays targeted for summer patch will be ineffective if applied before the 65°F threshold is reached.

Several applications at 28-day intervals are normally recommended for summer patch control. Sprays applied after symptoms occur will have very limited effects. Applicators must exercise caution in selecting fungicides for summer patch control because repeated use of the same class of fungicides for this disease will inadvertently lead to selection of fungicide-resistant strains of pathogens of other diseases such as anthracnose and dollar spot.

Relying solely on fungicides for summer patch control is always expensive and results often are inconsistent. Fungicide performance will be greatly improved with attention to cultural practices and use of less susceptible turfgrass varieties.

Residential Lawn Help

Managing summer patch in residential lawns is similar to the approach taken by professional turf managers. Outbreaks can be avoided by using resistant varieties of Kentucky bluegrass, and an outbreak's severity can be lessened with cultural practices that promote healthy roots. Core aeration in the spring or fall encourages deep rooting, improving the chance of turfgrass survival and recovery.

Irrigating properly, implementing an adequate nitrogen fertilizer program, and keeping mowing heights to 3 inches will reduce demands on the root system and diminish the likelihood of turf decline during hot, dry conditions. Consider fungicide application only if other options have been thoroughly exhausted, and then should be contracted through custom spray applicators.

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