THE OHIO STATE UNIVERSITY EXTENSION

Extension FactSheet

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Summer Patch on Turfgrass

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Turfgrass patch diseases such as summer patch, take-all patch and spring dead spot are difficult to diagnose and manage. They are caused by a group of fungi known collectively as the ectotrophic root-infecting or ERI fungi. The ERI fungi produce darkly pigmented runner hyphae along the surface of and ultimately inside the vascular tissue of roots. They typically colonize roots, crowns and stolons during environmental periods favorable for turfgrass growth resulting in compromised root function during periods of stress. The characteristic patch or ring spot symptoms associated with these diseases are typically not observed until the turfgrass is stressed by a change in environmental conditions or as a result of cultural management practices (Figure 1). Before 1984, the only confirmed turfgrass disease of this type in North America was take-all patch (formerly known as Ophiobolus blight or patch) caused by *Gaeumannomyces graminis* var. *avenae*. Today, at least six different patch diseases of turfgrass are recognized and include: necrotic ring spot caused by *Leptosphaeria korrae* (recently renamed *Ophiosphaerella korrae*); summer patch caused by *Magnaporthe poae*; spring dead spot of Bermudagrass caused by *Leptosphaeria narmari*; Bermudagrass decline caused by *Gaeumannomyces graminis* var. *graminis*; bentgrass dead spot caused by *Ophiosphaerella agrostis*; and take-all patch.

Figure 1. Active summer patch on a mixed creeping bentgrass/*Poa annua* putting green.

Causal Organism

Summer patch is caused by *Magnaporthe poae*. The disease is most often associated with Kentucky bluegrass (*Poa pratensis*; Figure 2), annual bluegrass (*P. annua*) and various turf-type fine fescues (*Festuca* species). It has also been reported as a problem on other *Poa and Festuca* species and has most recently been reported on creeping bentgrass (*Agrostis stolonifera*). The disease was first described in 1984 by Smiley and Craven-Fowler. Landschoot and Jackson identified the summer patch pathogen as *M. poae* in 1987. Without going into a lot of detail, summer patch was identified as a component of the Fusarium blight complex–along with necrotic ring spot–prior to 1984.

Figure 2. Summer patch on a mixed Kentucky bluegrass/*Poa annua* rough.

Signs and symptoms

Symptoms of summer patch are most prevalent and severe during hot (65-85°F), humid, or wet weather on stressed turfgrass grown in poorly drained soils. Frequent irrigation also tends to increase disease pressure. Soil pH does not appear to influence summer patch the way it does take-all patch. Colonization of the host begins when soil temperatures reach 65-70°F but symptoms don't generally appear until later in the season when temperatures peak (85-95°F). Optimal temperature for growth of *M. poae* in the laboratory is reported as 82-87°F.

Summer patch can be easily confused with other diseases caused by ERI fungi. Although not entirely valid from a scientific standpoint, many field diagnoses of turfgrass patch diseases are made based on the type of grass affected (i.e. take-all patch if creeping bentgrass; summer patch if *P. annua* on putting greens; necrotic ring spot if Kentucky bluegrass sod). Although somewhat useful for field diagnoses, the only sure way to know which disease one is dealing with is to have it analyzed by a turfgrass disease specialist or clinician. On high cut turfgrass such as in roughs and clubhouse surrounds, the disease shows up as irregular patches, rings, and crescents. The disease, even to a trained eye, appears very similar to necrotic ring spot. Patches are typically about 1 inch in diameter but often coalesce. On lower cut turfgrass, such as that found on golf course putting greens, the patches and rings are better defined. Yellowing and decline is often restricted to the *P. annua* in mixed bentgrass/*P. annua* swards (Figure 3). The roots, crowns and stolons of heavily infected turfgrass is often severely darkened due to the presence of a large amount of ectotrophic runner hyphae–a key diagnostic sign of this and other diseases caused by ERI fungi (Figure 4).

Figure 3. Active summer patch on a mixed creeping bentgrass/ *Poa annua* putting green. Note that only the *P. annua* is affected.

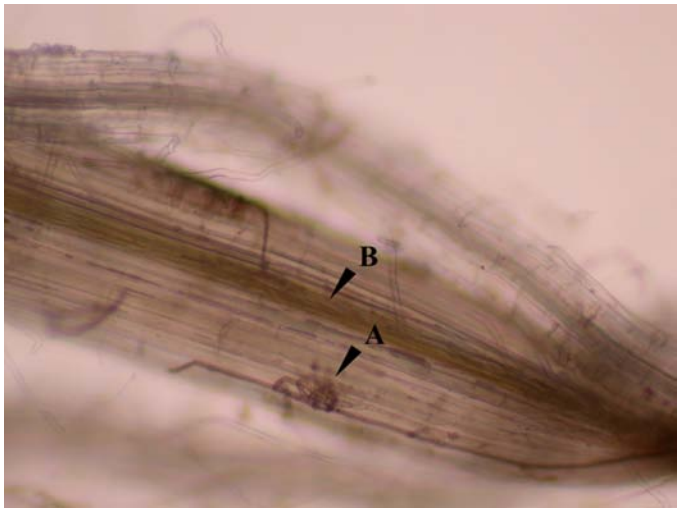

Figure 4. Ectotrophic runner hyphae (A) and vascular discoloration (B) in a root caused by *Magnaporthe poae*.

Management

The first line of defense to preventing or minimizing summer patch is through the selection and/or use of disease resistant turfgrass species/cultivars. Unfortunately, the use of genetically resistant turfgrass is limited to newly established or renovated turfgrass areas or in situations where overseeding is used. Many of the newly released Kentucky bluegrass varieties offer resistance to summer patch. Information regarding disease resistance can be obtained by contacting local turfgrass seed distributors, extension specialists, and the National Turfgrass Evaluation Program at: http://www.ntep.org .

For most, practical management of summer patch begins with the use of cultural practices designed to reduce stress and optimize turfgrass growth. Management practices that promote adequate drainage, reduce soil compaction, and promote healthy root growth along with a balanced fertility program are key to avoiding summer patch. The use of quick release N fertilizers and frequent light irrigation cycles should give way to the use of slow-release N fertilizers and deep, penetrating irrigation. Although often recommended but difficult to implement, avoid mowing turfgrass below recommended heights. In general, do anything and everything possible to reduce stress and promote healthy growing grass.

In addition to genetic host resistance and cultural practices designed to optimize turfgrass growth, timely preventive fungicide applications are typically warranted to manage summer patch. The key to managing ERI diseases with fungicides is to use them in a PREVENTIVE strategy. Fungicides labeled for use against summer patch on golf course turfgrass include: the stobilurins–azoxystrobin, trifloxystrobin, and pyraclostrobin; the sterol inhibitors–fenarimol, triadimefon, propiconazole and myclobutanil; thiophanate-methyl; iprodione; and fludioxonil. Thiophanate-methyl also works well as a curative fungicide against summer patch. Although turfgrass pathologists may vary somewhat as to their recommendations for when to begin fungicide applications, most agree that they should be made when soil temperatures (at 2 to 3 inches) reach 65°F–mid-May in Columbus and Indianapolis. When you know the location (i.e. roots, crown, shoots, and stolons) of the pathogen that you are targeting, apply accordingly. For example, in the case of the ERI fungi—summer patch included— we are trying to get the fungicide to the roots, crowns and stolons and thus spray volumes of 4 to 5 gallons per 1,000 ft^2 are typically recommended. Additional fungicide applications may be required or recommended during periods of pathogen favorable environmental conditions persist.

No biological control products are available for managing summer patch.

In summary, there are no "silver bullets" when it comes to managing summer patch. Cultural practices aimed at reducing turfgrass stress and promoting healthy root development along with the judicious use of preventive fungicide applications is often the long-term management strategy that leads to the successful management of this difficult to control and challenging turfgrass disease.

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