



Take-All Patch

Overview

Take-all patch, caused by the soilborne fungus *Gaeumannomyces graminis* var. *avenae*, is a destructive root and crown disease of creeping bentgrass putting greens, tees, and fairways. It can be especially problematic on newly constructed or renovated sites, including those with sandy soils, recently fumigated soils, or sites where natural disease-suppressive microorganisms have not yet become established. Disease pressure often declines naturally after several years as beneficial soil microorganisms build up.

The pathogen infects bentgrass roots primarily during cool, moist periods in fall and spring. Infected plants may tolerate the disease while temperatures are cool, but root damage limits water uptake and can result in rapid turf decline when hot and dry conditions develop in late spring and summer.



Figures 1-3. Initial symptoms of take-all patch in a bentgrass green. Colonization by resistant turf species in an infected patch. Severe infestation in a bentgrass tee during summer. Photos credit: Rob Golembiewski, Atticus.

Symptoms

- Initial symptoms typically appear as reddish-brown, yellow, or tan patches of declining or dead bentgrass, most commonly from late spring through summer (Figure 1).
- Patches may develop as rings, crescents, or irregular spots, ranging from a few inches to 3+ feet in diameter.
- Older patches may become slightly sunken relative to surrounding turf.
- The centers of patches are frequently colonized by annual bluegrass, fine fescues, or broadleaf weeds because the pathogen primarily damages bentgrass (Figure 2).
- Symptoms are often most severe following periods of heat and drought, when damaged roots cannot adequately supply water to the plant (Figure 3).
- Infected roots and crowns are typically brown to black. Close examination may reveal dark fungal hyphae growing along the surface of roots and crowns.

Cultural Management Strategies

Since take-all patch is a root and crown disease, significant infection may occur before symptoms appear on the turf surface. This makes preventative management particularly important.

- *Manage soil pH* - take-all patch tends to be more severe in soils with a pH greater than 6.5. An acidifying nitrogen source like ammonium sulfate can be used to gradually lower soil pH toward approximately 5.5-6.0.
- *Maintain balanced fertility* - low phosphorus and manganese levels have been associated with increased take-all patch severity. Applications of manganese sulfate (2 lbs/acre in spring) have shown reductions in disease severity.
- *Avoid unnecessary liming* - applications that raise soil pH above the preferred range for creeping bentgrass can increase take-all patch risk, particularly on sites with a history of the disease.
- *Promote healthy roots* - maintain appropriate irrigation practices and avoid prolonged drought stress. Since infected plants have compromised root systems, maintaining adequate soil moisture during periods of high evapotranspiration can reduce turf stress.

Fungicide Solutions

Take-all patch can be particularly damaging during the first several years following establishment. Disease management should begin before the onset of symptoms, rather than waiting until patches become visible.

- Fungicides are most effective when used preventively or very early in disease development because the pathogen infects roots and crowns before symptoms become apparent. Applications made after large patches have developed are generally less effective because much of the affected turf has already been killed.
- Best control of take-all patch occurs when fungicides are applied preventively in the fall (Sep.-Nov.), when soil temperatures are 45-60°F at a 2-inch depth.
- In situations of chronic take-all patch, fungicides should be reapplied preventively in the spring when soil temperatures reach >55°F for 5 days at a 2-inch depth, with 2-3 applications every 21-28 days required.
- Preventively, DMI and QoI fungicides are most effective against take-all patch along with combination products. Atticus solutions include Artavia™ 2 SC (azoxystrobin), Artavia™ Xcel (azoxystrobin + propiconazole), Protégé™ (azoxystrobin + difenconazole), Torrid™ (metconazole), Slant™ EC (propiconazole), Gunner™ 14.3 MEC Fungicide (propiconazole), and Deniker™ (prothioconazole).
- Curative applications in early summer can be helpful in speeding recovery. Fungicides must target infected roots, so apply the high label rate of Talaris™ 4.5 F (thiophanate-methyl) in combination with one of the above preventive fungicides with flat fan nozzles in 2-5 gallons of water per 1,000 sq. ft. (or use 0.25-0.5 inches of irrigation immediately after application) to ensure fungicide contact with the rootzone.
- For more information or assistance with selecting the best product(s) for your golf course, please contact your Atticus representative.