



Take-All Patch

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INTRODUCTION

Take all patch is a disease of creeping bentgrass and can occur on golf course putting greens, tees and fairways. The disease is caused by the root-infecting fungus *Gaeumannomyces graminis* var. *avenae*. Take-all commonly is found on sand-based putting greens within a few years following the initial construction or on creeping bentgrass grown on fairways constructed on previously wooded sites. The pathogen does not infect other turfgrasses.

SYMPTOMS

Initial symptoms are the result of extensive infection of creeping bentgrass roots when soils are cool and wet. Patches generally expand during the spring months as infected plants turn orange-tan and then begin to wilt. Patches may range from several inches to up to 3 feet in diameter and usually occur in clusters. Although the pathogen is not active during the summer months, infected creeping bentgrass plants will continue to wilt and may die due to shallow or compromised root systems. During the summer months, patch centers often are invaded by weeds or other undesirable turfgrasses.

CAUSAL AGENT

Gaeumannomyces graminis var. *avenae* is active when soil temperatures are cool in the spring and fall. Pathogen activity is influenced by pH and is significantly suppressed in acidic soils ($\text{pH} \leq 6.0$), while alkaline soils ($\text{pH} \geq 7.5$) are much more prone to infection.

Take-all patch symptoms generally develop 1 to 3 years after the initial establishment of creeping



bentgrass. The disease has also been shown to occur in areas fumigated prior to renovation.

Dark brown to black, ectotrophic runner hyphae often can be found on the roots and stolons of infected creeping bentgrass plants. Positive identification of the pathogen is often made by the presence of a darkened vascular system of infected roots, infection mats on stolons, and simple hyphopodia at penetration sites. Sexual fruiting known as perithecia are rarely found in nature and the importance of the spores in the disease development is relatively unknown.

MANAGEMENT

Cultural.

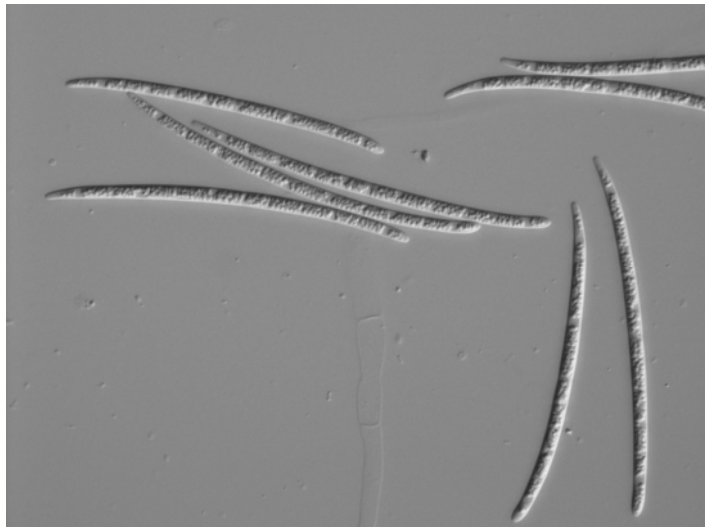
Because take-all patch infection is favored by alkaline soils, the application of acidifying treatments such as ammonium sulfate or sulfur coated urea should help in reducing disease severity. On the other hand, nitrate-based N-sources (potassium nitrate, calcium nitrate, sodium nitrate, etc.,) should be avoided as they may increase rhizosphere pH. In addition to acidification, monthly applications of manganese sulfate during the growing season may help to limit take all patch. A total of 6 to 8 lbs Mn per Acre may be necessary to suppress the disease.

Cultural practices that help to maintain a healthy turfgrass stand and root system will also alleviate damage from take-all patch. Aerification in the spring and fall and routine topdressing will help to reduce the build-up of organic matter and prevent compacted soils. During the summer months, careful attention should be given to irrigation and syringing practices to relieve drought stress.

Chemical.

Timing of fungicide applications and delivery of the product will influence the performance, regardless of products selected. Applications should be made

with the pathogen is active. Multiple applications of fungicides in the spring and autumn generally are most efficacious. Once symptoms are observed during the summer months, disease suppression with fungicides becomes limited and often provide erratic suppression. Due to the root-inhabiting nature of the pathogen, it is important to apply fungicides in at least 100 gallons of water per acre. If this is not possible, a light post-application irrigation cycle may assist in getting the fungicide to the crown and roots of creeping bentgrass plants. Effective fungicides include Banner MAXX[®], Bayleton[®], Rubigan[®], Heritage[®] and Insignia[®].



Adapted from BP-114-W, Richard Latin, Purdue University

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