

Best Management Practices: Pythium Root Dysfunction

Description

The summer months are typically the busiest time of the year for golf courses. Daily rounds increase, tournaments and large outings come and go, and there are more hours dedicated to daily turf management tasks. On top of all of this, summer is also the most stressful time for creeping bentgrass growth. The warmer soil and air temperatures slow overall growth and vigor making the turfgrass more susceptible to diseases. Some diseases display symptoms in summer, but infest creeping bentgrass during peak growing conditions in fall or spring. One of these is Pythium Root Dysfunction. This disease has primarily been a problem in the Mid-Atlantic and Southeastern States, but has also been documented in parts of the Midwest.



Environmental Conditions Favoring Disease Development

Pythium Root Dysfunction is an oomycete fungus that can be devastating to creeping bentgrass. There are multiple *Pythium* species that have been identified as causing Pythium Root Dysfunction. The most notable species are *P. volutum*, *P. aristosporum*, and *P. aphanidermatum*. This pathogen is active when soil temperatures are between 50 and 75°F during fall or spring. During this time, the pathogen begins to colonize creeping bentgrass roots of relatively newly established sand-based putting greens.

Symptoms and Identification

Unlike Pythium blight, Pythium Root Dysfunction does not develop fungal growth on the foliage. The presence of the disease is first observed when symptoms develop without any visual signs of fungal structures or growth. Disease symptoms can be evident year round, but the most severe symptoms are observed in summer. Initial symptoms can look similar to drought stress by turf displaying a wilted look. However, these symptoms quickly return after a normal irrigation cycle. Infected areas appear as tan to orange irregularly shaped patches that may reach several feet in size. Eventually, these patches will become necrotic and die, decreasing turfgrass density. Infected roots are tan-colored and lack root hairs, which impedes the plant's ability to absorb water and nutrients. These tan-colored roots without root hairs are one way of determining the difference between Root Dysfunction and Root Rot. With Pythium Root Rot the roots are black and rotten. Pythium Root Dysfunction roots are still alive, but not functioning at a high level. In later stages of the disease infected roots will eventually die. Involving a qualified Disease Diagnostic Lab would be recommended for proper diagnosis.



Management

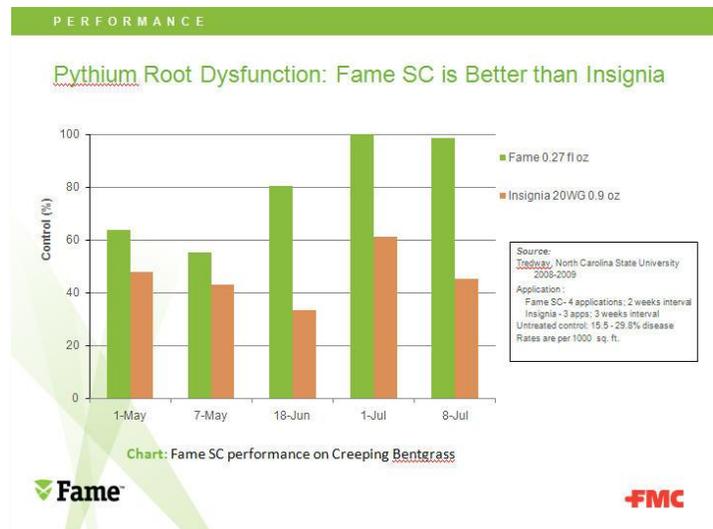
Cultural:

The primary focus of cultural management for Pythium Root Dysfunction involves management techniques to maintain root function, growth and development. Applying proper nitrogen and other essential nutrients throughout the year will encourage growth and development of new tissue. Spring and fall aerification as well as top dressing will provide needed gas exchange, water infiltration, and reduce compaction thus stimulating root growth. If symptoms develop during stressful growing times of summer, making adjustments like increased mowing heights on putting surfaces, substituting mowing with rolling to maintain green speed or using solid rollers instead of grooved rollers on mowers will also aid in reducing plant stress. Timely irrigation and hand syringing during summer will prevent drought stress in infected areas.



Chemical:

Pythium Root Dysfunction is best managed by using a preventative fungicide application program. Applications should be applied in spring and fall when the pathogen is active. This corresponds to soil temperatures being in the 50 to 75°F range. A proven preventative program would include two fall applications of Fame™ SC 21 to 28 days apart followed by spring applications at the same intervals. Fungicides should be lightly irrigated after treatment to move the fungicide down to the roots. Incorporating Fame™ SC into a program with products like Segway™ would ensure Pythium Root Dysfunction is kept at bay and further protecting creeping bentgrass from this destructive disease.



References

Kerns, J.P. and L.P. Tredway. 2010. Pythium root dysfunction of creeping bentgrass. Plant Health Progress. doi:10.1094/PHP-2010-0125-01-DG.
 Dernoeden, P.H. 2000. Creeping Bentgrass Management: Summer Stresses, Weeds and Selected Maladies. Sleeping Bear Press, Chelsea, MI. pp. 39-44.
 Pythium Root Dysfunction. www.TurfFiles.ncsu.edu
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