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Pythium Induced Root Dysfunction

Pythium induced root dysfunction (PRD) unlike other *Pythium* diseases, occurs during warm, dry weather, in drought prone areas, and in high sand content root zones with good drainage. It occurs only on golf greens. Primarily a disease of newer creeping bentgrass stands, this disease is most commonly found where 1.) native soil established greens are overlaid with several inches of sand and 2.) on newly established, sand-based creeping bentgrass greens. PRD is caused by *Pythium volutum*, *P. aristosporum*, and a few other species of *Pythium*. Root infection occurs at soil temperatures between 50-75°F (10-24°C), but symptom expression is delayed until the turf experiences heat/drought stress. As long as growing conditions remain optimal for turf, the pathogen and plant coexist without evidence of disease.

Turf foliage appears yellow to bronze or brown and plants are prone to wilting prior to collapse. A generalized thinning and decline of turfgrass stands develops. Patches of affected turf may be up to 2 feet in diameter. Symptoms first appear in drought prone areas and root systems of affected turf are shallow, discolored, and lack root hairs. Infected roots die back more rapidly than uninfected roots subject to heat stress. Low fertility and low soil oxygen can exacerbate symptoms. Death of the plant often results from the mechanical injury resulting from mowing stressed plants with a dysfunctional root system. Cultural methods for managing PRD include those practices which stimulate root growth.

Cultural Management

- Improve drainage and aerify as needed. Excessive organic matter accumulation in the root zone of a sand-based green can hold excess moisture.

- Raise mowing height above 0.125 inches and reduce mowing frequency, rolling greens daily to maintain green speed and quality. Maintain increased height until turf recovers.
- Irrigate carefully based on turf needs rather than a schedule, hand water severely affected areas, or add a wetting agent to improve water penetration into the root zone.
- When PRD is active, avoid mowing when the turf is wet to prevent mechanical damage to weakened turf.
- Provide adequate nitrogen. This syndrome is most prevalent in areas of low N fertility. High N encourages *Pythium*, while low N can hinder recovery.
- Cultivate and topdress to optimize soil oxygen levels. Consider using a walk behind mower. Relieve soil compaction if present.
- Overseed as soon as possible after an outbreak.

Chemical Management

Preventive chemicals are recommended in areas of past *Pythium* problems as fungicides are more effective when applied preventively. In areas of past PRD infection, start fungicide applications when soil temperatures reach 50-75°F (10-24°C). Repeat applications in the fall when soil temperatures again fall into this range. Fungicide applications should be applied in 4-6 gallons of water/1000 sq ft or watered in with at least 0.125 in of irrigation.

For a listing of fungicides currently labeled to manage this disease, refer to the Disease Management chapter of UMass Extension's [**Professional Guide for IPM in Turf for Massachusetts**](#).

Author: M. Bess Dicklow, 2011: revised by Angela Madeiras, 2020

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Publications & Resources

Printed Publications

Best Management Practices

Nutrient Management Information

Professional Turf IPM Guide

Fact Sheets

References

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