Pythium Turf Diseases

Bayer Solutions

// THE PROBLEM

Pythium turf diseases cause real problems for golf course superintendents. Four major diseases are caused by various Pythium species: Pythium foliar blight, damping off, root rot and root dysfunction. Pythium species are not true fungi and therefore require specialty control products to limit their spread. Signature XTRA™ Stressgard® and Banol® are effective fungicides for all Pythium diseases. Resistance has not been an issue for either fungicide after more than 20 years of commercial use, making them reliable choices for Pythium control.

// WHAT TO LOOK FOR

Pythium Blight. Symptoms appear as sunken, greasy black patches and streaks on turf that can take on an orange to dark grey colour. Affected turf is often matted and has a water-soaked appearance. White, cottony mycelium is typically present in the early morning. Blight can kill turf in 24-48 hours and preventive measures are key for controlling this disease. Pythium blight has the ability to rapidly spread to neighboring plants by a leaf-to-leaf network of aerial mycelium as well as oospores traveling through surface water. Although most foliar blights occur under hot/humid conditions, some species of Pythium can also induce blights during cooler temperatures.

Damping Off. Various Pythium species can cause rapid decline to seedling turf. The behaviour of damping off is similar to Pythium blight. Young seedlings, which require frequent irrigation and nutritional inputs, are extremely vulnerable to damping off. All seedling turf grown in Canada is vulnerable to infection; however, the bentgrasses, fescues and ryegrasses are most susceptible.

Pythium Root Rot. Affected turf can show irregular chlorotic, yellow or orangish patches or streaks, or thinned areas of turf. No foliar mycelium is produced, but roots may appear water-soaked and rotted or show a significant reduction in mass or root hair production. Microscopic diagnosis may be needed to detect Pythium infestations in roots. Root rot can occur in cool or hot conditions, and is especially active when soil is wet and plants are stressed.

Pythium Root Dysfunction. This disease is caused by *Pythium volutum* and is seen primarily on creeping bentgrass that is under stress. Infections take place in the spring and fall, reducing root growth, but symptoms can appear later when plants are under stress. Affected areas are patches up to 0.5-0.75 m in size that show wilt or decline and can turn orange or brown. Root mass and root hairs are greatly reduced, and plants tend to collapse under high temperature conditions. Microscopic diagnosis is required to confirm the presence of *P. volutum* in roots.

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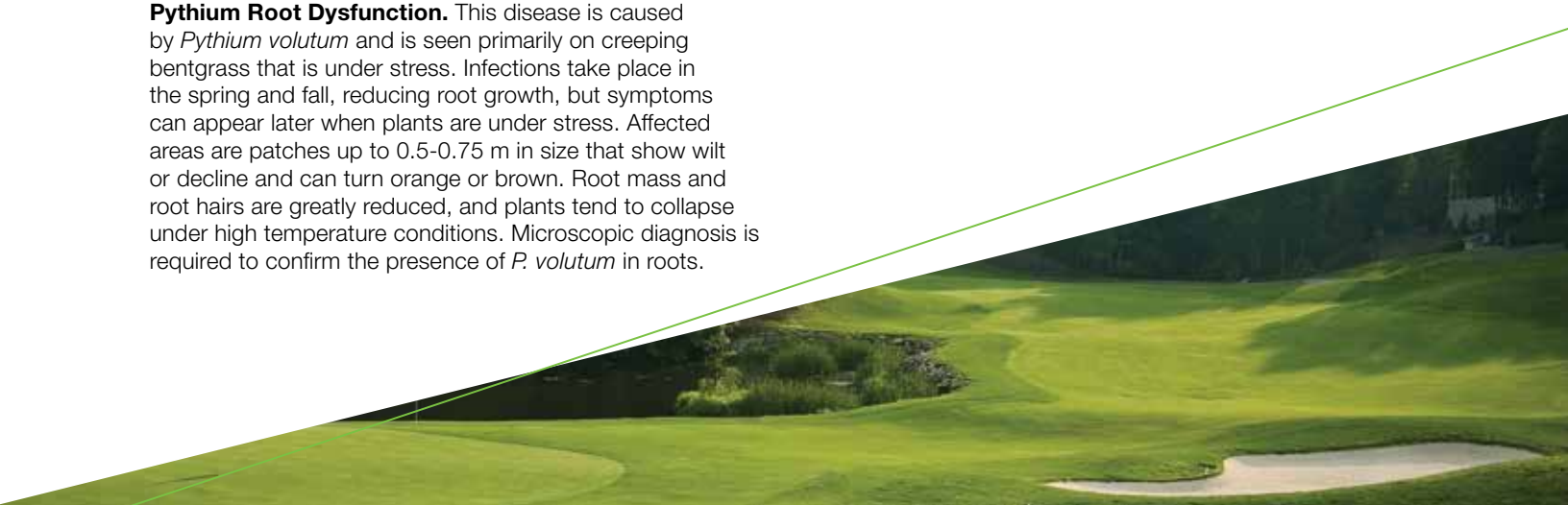
All of these Pythium diseases require different management approaches as shown in the chart on the next page. Prevention is a common key for all of these diseases as they tend to occur when the turf has poor chances for recovery.

Signature XTRA Stressgard provides excellent preventive activity against Pythium diseases. Since it is fully systemic, there is no need to water in applications. Signature XTRA Stressgard has unique Stressgard® Formulation Technology and should be used as part of a seasonal disease control and plant health program.

Banol has reliable preventive and curative activity. For Pythium blight, applications need to be targeted on to the foliage and crowns; for Pythium root rot, the application needs to be watered into the upper root zone to be most effective.

For Pythium root dysfunction, Signature XTRA Stressgard and Banol should be combined in a spring and fall rotation program.



Pythium Turf Diseases

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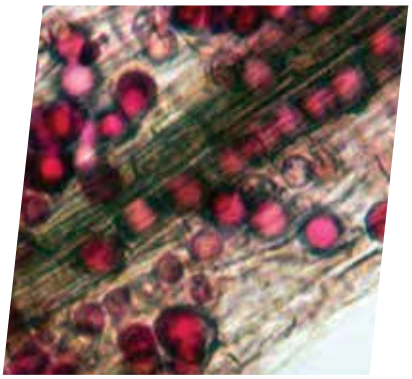
Solution	Pythium Blight (High Temperature)	Pythium Blight (Low Temperature)	Pythium Root Rot	Pythium Root Dysfunction
Primary Species Involved	*P. aphanidermatum* *P. myriotylum*	*P. graminicola* *P. ultimum*	*P. gramincola* *P. ultimum* *P. torulosum* *P. vanterpoolii* + many others	*P. volutum*
Typical Conditions for Disease Development	Daytime temperatures of 29-37°C; night-time temperatures above 20°C. Hot and wet. Problematic on newly seeded turf in hot, wet conditions (damping-off).	Daytime temperatures below 13-16°C. Cool and wet.	Low plant growth potential in hot or cold conditions and wet soils. Worst on stressed turfgrass.	Newly-established greens and/or stressed turfgrass. Soil temperatures of 10-25°C (spring and fall) but damage can appear under summer stress conditions.
Cultural Conditions Favouring Disease	Excessive nitrogen fertility, poor soil drainage and air movement.	Excessive nitrogen fertility, poor soil drainage and air movement.	Poor soil drainage and air movement; plant stress.	Low fertility, soil compaction and plant stress.
Host Species	Primarily cool-season turf.	Primarily cool-season turf.	Cool- and warm-season turf.	Creeping bentgrass only.
Primary Location	Primarily cool-season turf.	Primarily cool-season turf.	Cool- and warm-season turf.	Creeping bentgrass only.
Using Signature XTRA Stressgard	120-200 g per 100 m^2 at 14-21 day intervals in 6-10 L of water per 100 m^2.			Creeping bentgrass only.
Using Banol	64 mL per 100 m^2 (preventive & curative) Use a 7-21 day interval with the shorter interval under high disease pressure. Apply in 8-20 L of water per 100 m^2, using 12-20 L water for higher cut turf. Water-in for root rot control, but leave on foliage for controlling blight.			120 g Signature XTRA Stressgard + 64 mL Banol per 100 m^2 as part of a spring and fall rotation program. Apply in 8 L of water per 100 m^2 and leave on the foliage. DO NOT WATER-IN.

Prolific aerial mycelium is a characteristic sign of Pythium blight. *Photo: Jesse Benelli, Bayer.*

Orange colour and irregular pattern of symptoms associated with Pythium blight on cool-season turf. *Photo: Derek Settle, Bayer.*



Pythium oospores in roots (stained red with acid fuschin). *Photo: Frank Wong, Bayer.*

Pythium root rot reduces root mass in cool or hot, and wet conditions. *Photo: Lee Burpee, University of Georgia.*