

Pythium Turf Diseases

The problem

Pythium turf diseases cause real problems for golf course superintendents. *Pythium* pathogens cause a host of different turfgrass diseases, affecting various parts of the plant, and each has unique environmental conditions favouring their development. Four major diseases are caused by various *Pythium* species: *Pythium* foliar blight, root rot, root dysfunction and damping off. *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* Foliar Blight.** This disease occurs during stretches of very hot and humid conditions, especially when daytime temperatures are above 28 °C and nighttime temperatures are above 20 °C. 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 on higher cut turfgrass. Blight can kill turf in 24–48 hours and preventative measures are key for controlling this disease. *Pythium* blight has the ability to rapidly spread by aerial mycelium as well as oospores traveling through surface water. Some species of *Pythium* can also induce blights during cooler temperatures.

***Pythium* Root Rot.** Affected turf shows irregular patterns of thinning and necrosis with no defining symptoms. 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 is needed to detect *Pythium* infestations in roots. Conditions favouring disease development are poorly drained and compacted putting green rootzones during periods of excessive moisture. This can occur anytime when soil temperatures are above 10 °C.

***Pythium* Root Dysfunction.** This disease is caused by *Pythium volutum* and is seen primarily on sand-based creeping bentgrass putting greens under stress. Infections take place when soil temperatures are between 13 °C and 24 °C and soil moisture is abundant. However, above-ground symptoms often do not appear until periods of heat and drought stress. Affected patches can be up to 0.6 m in size, appearing as wilt/drought stress, and can turn orange or brown. Root mass and root hairs are greatly reduced, and roots appear bulbous and stubby. Microscopic diagnosis is required to confirm the presence of *P. volutum* in roots.

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.

Envu solutions

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 preventative 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 preventative 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.

Solution	<i>Pythium</i> Blight (High Temperature)	<i>Pythium</i> Root Rot	<i>Pythium</i> Root Dysfunction
Primary species involved	<i>P. aphanidermatum</i> <i>P. myriotylum</i>	<i>P. gramincola</i> ; <i>P. ultimum</i> ; <i>P. torulosum</i> ; <i>P. vanterpoolii</i> + many others	<i>P. volutum</i>
Typical conditions for disease development	Daytime temperatures of >28 °C; nighttime temperatures above 20 °C. Hot and wet. Problematic on newly seeded turf in hot, wet conditions (damping off).	Wet soils when soil temperatures exceed 10 °C. Worst on stressed turfgrass.	Newly established greens and/or stressed turfgrass. Soil temperatures of 10–25 °C but damage appears under summer stress conditions.
Cultural conditions favouring disease	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	Cool-season turfgrass.	Cool-season turfgrass.	Creeping bentgrass only.
Primary location	All turfgrass settings.	Primarily putting greens.	Primarily putting greens.
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 .		
Using Banol	64 mL per 100 m ² (preventative and 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 higher volumes for higher cut turf. Water-in for root rot control, but leave on foliage for controlling blight and damping off.		



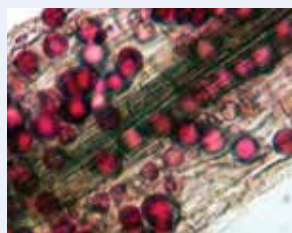
Proliferous aerial mycelium is a characteristic sign of *Pythium* blight.

Photo: Jesse Benelli, Envu



Orange colour and irregular pattern of symptoms associated with *Pythium* blight on cool-season turf.

Photo: Derek Settle, Envu



Pythium oospores in roots (stained red).

Photo: Frank Wong, Envu



Pythium root rot reduces root mass in cool or hot and wet conditions.

Photo: Lee Burpee, University of Georgia

To talk about your specific needs or to learn more about our solutions, please contact an Envu representative.

