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G88-890 Pythium Blight of Turfgrass

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Pythium Blight of Turfgrass

Causes, symptoms and treatment for pythium blight are covered here.

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Pythium blight, sometimes called "grease spot" or "cottony blight," is no longer a disease of golf courses; it also is a serious problem in home lawns and other turfs. Caused by several species of Pythium fungi, the two most commonly associated with Pythium blight are *Pythium aphanidermatum* and *P. graminicola*.

These fungi are in a group known as "the water molds," a group that includes *Phytophthora* and other pathogenic genera. They are referred to as "water molds" because they function best under wet, saturated soil conditions.

The Pythium species that attack turfgrass survive well in thatch, infected leaves and roots, and soil. These organisms are ubiquitous and capable of invading turfgrass leaves, crowns and roots from spring to fall.

Disease Occurrence and Predisposing Conditions

Species of *Pythium* pathogenic on turfgrass survive in thatch and soil as thick-walled resting spores called oospores, and in turfgrass leaves and roots as vegetative mycelium. All turfgrass species are susceptible to attack by one or more of the Pythium fungi pathogenic on turf.

The two most important criteria for disease occurrence are poor soil drainage and a wet turfgrass canopy. Waterlogged soils and a moist thatch layer, along with high relative humidity (80 percent RH or above) and day temperatures in the 90s with warm nights, provide an ideal environment for an outbreak of Pythium blight. As a general rule of thumb, when night-time temperature plus relative humidity equals 150, conditions are right for an outbreak of Pythium blight.

A Pythium blight detection kit is available commercially to professional turfgrass managers. This kit can detect disease before symptoms are visible. When these conditions exist, the mycelium within leaves grow rapidly, and the oospores germinate forming more mycelium which also infects grass leaves.

The infection process, symptom development and spread of the disease occur rapidly, and large turf areas can

be destroyed within 24 to 48 hours after the onset of disease-favorable weather.

The *Pythium* fungi are spread when infected grass blades cling to shoes, mowers and other equipment, and when pieces of mycelium are moved by flowing surface water, equipment or foot traffic. The living and dead grass plants in areas infected the previous season or early in the present season are primarily infection centers for each *Pythium* blight outbreak. The size of the infected areas continues to grow with each outbreak.

Because of the ubiquitous nature of *Pythium* fungi, disease occurrences are not limited to just high temperatures. *Pythium* blight may occur in May or September during extended periods of cool (50° to 70°F), wet weather. This can present problems when homeowners or turf managers are trying to establish new turf stands. Newly seeded tall fescue and perennial ryegrass can be thinned due to brief outbreaks of *Pythium* blight. New stands are especially vulnerable when high seeding rates, heavy nitrogen fertilization and overwatering are used.

Symptoms

Blight Symptoms

Unlike dollar spot, rust or powdery mildew, where only the foliage is damaged and plants often recover quickly, *Pythium*-blighted plants usually die. Recovery of blighted turfs from rhizomes or stolons that fill in from outside areas or from germination of annual bluegrass seed is slow and normally doesn't occur until the onset of cooler weather.

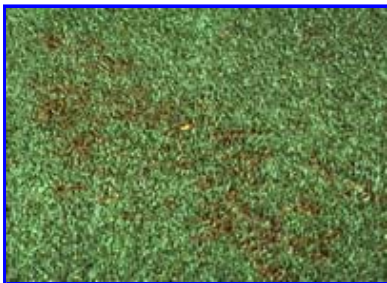


Figure 1. Diseased area begins with small reddish-brown spots.

Pythium blight always starts as a spot disease with the first visible symptoms being small (six inch), roughly circular, reddish-brown spots that suddenly appear (*Figure 1*). The sudden appearance of large, irregular or circular patches probably are not symptoms of *Pythium* blight, but more likely those of brown patch, summer patch or necrotic ring spot.

Pythium blight may occur in streaks conforming to surface drainage patterns, in localized low spots where water puddles, or in larger areas where the individual spots have coalesced. The spots developing on higher cut lawns or fairway turfgrass tend to be larger and more irregular in shape than those occurring on golf greens and tees where the turf is cut short.



Figure 2. White fungal mycelium that resembles a cotton ball.

In the morning dew, infected grass leaves appear water-soaked, slimy to the touch, and dark green. When the grass is wet, a white fungal mycelium, resembling a fluffy cotton ball (*Figure 2*), can be present on the grass blades. Infected plants collapse and cause the grass in the blighted spots to appear matted.

Sometimes the infected area may give off a fishy odor. This odor can be detected by removing a plug of diseased turf and placing it into a plastic bag. Seal the bag, and put it in a warm spot. Within a few hours both the fishy smell and characteristic mycelium should be noticeable. By mid-morning the infected leaves dry, shrivel, and turn reddish-brown.

The disease is most easily diagnosed when the infected area is observed in the early morning when the characteristic mycelium and greasy appearance of the blighted turf are present. These signs and symptoms can be extended later into the morning by covering one of the spots so that it will not dry out.

If the weather remains hot and humid, the spots coalesce and often kill large areas of turf. A sudden drop in temperature and/or relative humidity shortly after the onset of symptoms will produce dollar spot-like symptoms. Only a portion of the leaf is blighted, producing distinct, small, straw-colored spots; however, the individual leaf blades will not show the tangential banding typical of dollar spot.

Seedling Blight

A waterlogged soil, dense seeding and lush growth create a seedbed environment conducive to the damping-off of young seedlings. When this occurs, seedlings generally die in irregular patches within the seedbed, giving the stand a patchy appearance. Seedlings infected after emergence show a dark, water-soaked rot at the soil line. These seedlings turn yellow, collapse, then die. When seedling blight is extensive stands can appear yellow, as if they were nitrogen deficient.

Root and Crown Rot

Pythium species are efficient root rotting fungi capable of causing general decline in established turf. Symptoms of declining turfgrass health are nonspecific and may be indicated by slower growth, yellowing, stunted roots or stand thinning. Other root rotting fungi and certain plant parasitic nematodes also cause general turf decline, so a positive diagnosis of the problem usually requires laboratory analysis.

Prescription for Health Turf

No single control measure will provide complete protection against an outbreak of Pythium blight. Turf managers must employ a combination of good management practices and timely application of fungicides to avoid damage. The key ingredients for successful prevention are to keep from creating a micro-environment conducive to Pythium blight and to use a preventative fungicide program on highly valued or highly vulnerable turf.

Cultural practices.

A good management program does not use cultural practices that could lead to disease development, but does use those that favor the grass plant rather than the pathogen's development. In developing a good management program:

1. Provide adequate soil drainage.
2. Fill depressions where water puddles.
3. Thin landscape plantings to promote good air movement across the turf.
4. Avoid mowing and trafficking wet turf.
5. Use a balanced fertilizer program that will meet the nutritional needs of the turf but not stimulate lush growth during summer.
6. Avoid overwatering and late-afternoon and early evening watering during periods of hot, humid weather.
7. Reduce thatch accumulation by regularly aerating or power raking, if necessary.
8. Do not saturate the soil on newly seeded areas, and remove mulch immediately after seeding emergence.

Fungicides

The application of protective or therapeutic fungicides when Pythium blight is most likely to occur usually is needed to augment cultural practices. On highly valuable or highly vulnerable turfs, a preventative spray program using a systemic fungicide applied prior to the onset of hot, humid weather is recommended.

In Nebraska, mid-June is a good target date for the first application; however, turf managers must be flexible

enough to move that date forward if hot, humid weather is forecast earlier than expected.

The Pythium blight detection kit can be of considerable help in monitoring blight-prone areas to better time the first preventative application. Proper use of the kit also can help determine if and when second and third treatments are needed. Beginning in early May, turf managers should pay close attention to weekly weather forecasts. When day temperatures above 85°F with warm nights and a relative humidity above 90 percent are forecast, managers should make the first application, immediately. Any indecision may be a costly mistake.

The systemic fungicides containing fosetyl A1, metalaxyl, or propamocarb (*Table I*) should provide protection for at least 10 to 14 days. An outlined preventative spray program for Nebraska would be as follows:

1. First application mid-June or earlier, if necessary, using a systemic fungicide such as fosetyl A1, metalaxyl, or propamocarb.
2. Second application two weeks later, also using a systemic fungicide.
3. Third application of a contact fungicide, such as chloroneb or ethazol, two weeks after application number two.

Curative measures using contact fungicides can be employed on less valuable turf areas and those less prone to Pythium blight. The first treatment should be made when the 24-hour forecast calls for weather favorable to Pythium blight or when blight symptoms first appear.

Should season-long control be necessary, products should be rotated to minimize any chance of the pathogen developing a tolerance to a particular fungicide.

Table I. Fungicides¹ for the control of Pythium blight.	
Common Name	Some Trade Names
Chloroneb	Chloroneb, ProTurf Fungicide II, Teremec SP, Terraneb SP
Ethazol	Koban, Terrazole
Fosetyl A1	Aliette Fungicide
Metalaxyl	Subdue, ProTurf Granular Pythium Control
Propamocarb	Banol
¹ Fungicides listed in <i>Table I</i> represent the best information available. No criticism is intended of products not listed, nor is endorsement by the University of Nebraska given to those listed. Read and follow all product label directions for mixing and application.	

The fungicides listed in *Table I* are not readily available to homeowners. The homeowner is advised to seek professional diagnosis if Pythium blight is suspected and to employ the services of a commercial applicator if chemical treatment is recommended.

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