

PYTHIUM DISEASES OF TURFGRASS



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Numerous species of *Pythium* cause many different diseases of all turfgrasses, especially the cool-season grasses. The exact *Pythium* disease depends on the plant tissue attacked, the species of *Pythium*, and the environmental conditions.

Damping-off: *Pythium* species are natural inhabitants of the soil. When the pathogen is growing rapidly and seedling growth is slow, disease can result in seedling loss. If moisture, temperature, and light are not optimal for seedlings, seed decay and damping-off becomes more likely.



Crown and Root Rot (Root Dysfunction): Many species of *Pythium* cause diseases of roots and crowns that result in a general decline of turfgrass stands. Symptoms are nonspecific with affected turf appearing thin, off-color, and slow growing. The disease may occur in small patches or involve large areas, especially on highly maintained golf course greens. Symptoms may appear from early spring to late autumn. In warm, wet weather, large areas of turf may wilt, turn brown, and die. The crowns of individual plants are water soaked and discolored. Roots are greatly reduced and discolored. Microscopic examination of infected tissue reveals large numbers of oospores (survival structures) and sporangia (spore-bearing structures).

Snow Blight: This foliar blight is favored by high fertility, poor drainage, extended periods of cold, rainy weather, and saturated soil underlying snow cover. At least six *Pythium* species can cause snow blight which results in small tan to orange spots or an uniform blight. Foliar mycelium may or may not be present, roots are mostly unaffected, but crowns can be extensively rotted which results in plant death.



Pythium Blight (Grease Spot, Cottony Blight): This foliar blight usually appears suddenly in warm to hot, humid weather. Symptoms are orange to bronze colored, circular spots, 0.75" to 6" in diameter which enlarge rapidly. Blighting may also appear in streaks that follow the movement of water or machinery. Individual leaves appear water-soaked, dark, and oily to the touch (hence the name "grease spot"). When the humidity is high, especially at night, the collapsed leaves may be covered with a fluffy, white mass of mycelium ("cottony blight"). Spots may coalesce to form large, irregularly shaped areas of dead turf, especially in areas of poor drainage.

Pythium species are unique among plant pathogenic organisms in that they have a swimming stage (zoospore); they cause serious damage only under wet conditions. Dense, highly fertilized grass is most susceptible to attack and the disease may become more severe where the soil is alkaline. Foliar blight is most severe when temperatures are between 86-95° F: crown and root rot can occur under both low and high soil temperatures depending upon *Pythium* species. Snow blight is most serious on turf growing in unfrozen, saturated soil underneath snow cover. *Pythium* species can be transported over large distances by water or equipment as mycelium, infected plant material, or infested soil.

Management:

- Improve surface and subsurface drainage.
- Avoid over watering and watering late in the day.
- Use fungicide treated seed if planting during warm, moist periods.
- Water thoroughly and infrequently.
- Avoid nitrogen over fertilization. Use slow release forms of nitrogen.
- Mechanically remove thatch if it exceeds 0.5”.
- Do not mow when the grass is wet or when foliar mycelium is present.
- Prune trees and shrubs to improve air circulation and light penetration.
- Promote vigorous root growth by raising mowing height, reducing mowing frequency, and other management practices to reduce plant stress.
- Avoid aeration, vertical cutting, or topdressing of diseased greens.
- Apply fungicides based upon a weather based forecasting model.

Chemical recommendations:

Fungicides targeting *Pythium* should be applied in recommended tank mixes or rotated. Repeated applications of the same fungicide or fungicides with the same mode of action favor the development of fungicide resistance.

azoxystrobin (Heritage): 0.4 oz/1000 sq ft (REI 4 h). Begin applications before symptom development. During periods of prolonged favorable conditions, use the shorter interval. Do not rotate with pyraclastrobin (Insignia).

etridiazole (Terrazole): 2-4 oz/1000 sq ft (REI 12 H). Begin application at the first sign of disease. Under severe conditions, use the highest rate and shortest interval.

foestyl-AL (Signature): 4 to 8 oz/1000 sq ft (REI 12 h). Begin preventive applications when conditions favor disease development.

mefenoxam (Subdue Maxx): 0.5 to 1 fl oz/1000 sq ft (REI 0 h). Apply as a preventive treatment. Use higher rate and shorter interval when conditions favor disease development. Do not make more than one application of Subdue before rotating with a fungicide with a different mode of action.

phosphonate (Magellan): 4.1 to 8.2 fl oz/1000 sq ft (REI 4 h). Apply preventively when conditions favor disease development and repeat if conducive conditions persist.

propamocarb (Banol): 1.3 to 4 fl oz/1000 sq ft (REI 24 h). Apply as a preventive treatment. Use higher rate and shorter interval when conditions favor disease development.

pyraclostrobin (Insignia): 0.9 oz/1000 sq ft (REI 4 h). Begin applications before symptom development. During periods of prolonged favorable conditions, use the shorter interval. Under severe disease pressure, tank mix pyraclostrobin with another (non-strobilurin) fungicide with a different mode of action. Do not rotate with azoxystrobin (Heritage).

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