

NOTE: THE FOLLOWING INFORMATION IS OFFERED AS A GUIDE FOR PROSPECTIVE CHALLENGES TO MANAGING SEASHORE PASPALUM. ALL TURFGRASSES ARE SUBJECTED TO INSECT, DISEASE, AND WEED PRESSURES. PROPER MANAGEMENT IS THE KEY TO SUCCESS. YOU MUST CHECK ALL LABELS OF THE PESTICIDES TO BE USED ON THIS GRASS FOR LEGAL AND PROPER USE. MENTION OF A PARTICULAR PRODUCT IS NOT AN ENDORSEMENT OF THAT PRODUCT BUT REFLECTS WHAT IS KNOWN AT THE PRESENT TIME. ENVIRONMENTAL INTERACTIONS, INCLUDING SALINITY THAT IMPACT SPECIFIC SITES, MAY GIVE VARIABLE RESULTS IN THE USE OF SOME PRODUCTS.

PYTHIUM BLIGHT

PYTHIUM ROOT DYSFUNCTION

PYTHIUM ROOT ROT

+++++

Pythium blight diseases

(Pythium graminicola, P. vanterpoolii, P. ultimum, P. aristosporum, P. iwayamani, P. paddicum, P. periplocum, P. torulosum P. aphanidermatum)

High temperature: *P. aphanidermatum, P. myriotylum*

Low temperature: *P. granimicola, P. ultimum*

Symptoms: organisms attack the foliar components of the plant; form white cottony blight, small sunken greasy black streaks or spots or patches that suddenly appear during warm, prolonged wet periods; water-soaked appearance, greasy looking, dark lesions. Leaves shrivel and turn from green to light brown to reddish orange to dark grey colored patches that follow drainage or mowing patterns; damages crown and stolons as well as surface foliage; usually develops under high humidity, excess water conditions (12+ hour

exposure) with temperatures >86°F during the day and 55°F to >68°F at night, especially >90°F day temperatures with consistent high moisture and 90% humidity. Mainly occurs on native soils; minimal occurrence on sand based profiles. Cultural conditions favoring development: excessive nitrogen fertility; poor soil drainage and air movement. Can kill turf in 24-48 hours. High risk conditions: 150 rule=minimum daytime temperature + maximum relative humidity is greater than 150

Cultural control: remove thatch

limit nitrogen applications

avoid overwatering and overfertilization (lush growth)

improve air circulation

improve functional drainage

aerify regularly

Suggested Fungicides: (ROTATE MODE-OF-ACTION CHEMISTRIES)

azoxystrobin (Heritage) Heritage Action (acibenzolar-s-methyl for stress tolerance inducement)

azoxystrobin + cyproconazole (Quadris Xtra)

azoxystrobin + tebuconazole (ArmorTech ZOXY-T; Strobe T)

fosetyl Al (Alliete, Chipco Signature, Prodigy Signature, Autograph®, Viceroy 70DF)

propamocarb hydrochloride (Banol)

chloroneb (Termec, Terraneb, Proturf)

dexon (Lesan)

metalaxyl/mefanoxam (Subdue Maxx)

metalaxyl (Verio)

pyraclostrobin (Insignia)

fludioxonil + mefenoxam (Apron Maxx, Medallion, Warden, Maxim®)

difenoconazole + fludioxonil (Instrata Elite)

chloroneb (Terramec)

mancozeb + copper hydroxide (Junction)

etridiazole (Koban, Terrazole L, Truban)

azoxystrobin + propiconazole (Headway, Quilt)

potassium phosphite (Alude, Vital, Fosphite, Prophyt, Whippet, Foli-R-Fos, Phos Pro, Agri-Fos, Lexx-A-Phos, Phospho-Jet, Resist, Fungi-phite, Appear + color pigment), Jetphiter)

***Pseudomonas aureofaciens* strain TX-1 microbial biofungicide: (Spot-Less)**

Pseudomonas strain (Zio biological fungicide)

thiophanate-methyl (AllBan, Fungo)

propionic acid methyl ester (Mefenoxam 2)

etridiazole + thiophanate methyl (Banrot)

cyazofamid/cyanoimidazole (Segway) 0.45-0.90 fl oz/1000 sq.ft. (pythium root dysfunction)

propamocarb hydrochloride (Proplant)

fluopicolide + propamocarb (Stellar)

ammonium chlorides (Agrisan 20, Pro-Tech)

potassium phosphite + chlorothalonil (Vitalonil)

Triton (triticonazole)+ Signature (forsetyl AI) or Banol (propamocarb hydrochloride)

pyraclostrobin + boscalid (Pageant, Honor)

pyraclostrobin + triticonazole (Pillar G)

fluxapyroxad + pyraclostrobin (Lexicon)

Bacillus subtilis strain GB03 biofungicide (Companion)

mono- & di- potassium salts of phosphorus acid (Appear) with color pigment (Daconil Action™: chlorothalonil) or /Secure®(fluazinam) or Traction (fluazinam + tebuconazole)

+++++

Pythium root dysfunction

Caused by *Pythium volutum* or *P. torulosum* (21-28 day preventative schedule); additional organisms include *P. aristosporum*, *P. arrhenonmanes*, *P. aphanidermatum*, *P. catenulatum*, *P. graminicola*, *P. vanterpoolii*, and *P. ultimum*.

Severe damage (impairs root hair developments) on infected roots at 61°F (range 55-75°F) during the Fall and Spring, but symptoms are not expressed until the turf is subjected to heat (soil temperatures >90°F.) or drought stress. Does not kill the roots, but does impair root functions as well as root hair development. Root dieback occurs rapidly with heat exposure (>90°F). Apply fungicides in the spring and fall when the roots are redeveloping with aerification.

cyazofamid/cyanoimidazole (Segway) 0.45-0.90 fl oz/1000 sq.ft.

fluopicolide + propamocarb (Stellar) 1.2 oz/1000 sq.ft. or 52 oz/acre

pyraclostrobin (Insignia) 0.9 oz/1000 sq.ft. (best results)

fosetyl AI (Signature, Alliete, Autograph®, Viceroy) 4 oz/1000 sq.ft. + propamocarb hydrochloride

(Banol) 2 oz/1000 sq.ft. or metalaxyl/mefanoxam (Subdue Maxx) 1 oz/1000 sq.ft. *****

propamocarb hydrochloride (Proplant)

pyraclostrobin + boscalid (Pageant, Honor)

pyraclostrobin + triticonazole (Pillar G)

fluxapyroxad + pyraclostrobin (Lexicon)

Insignia, Heritage

++specific oomycete fungicides (Terrazole, Banol, Subdue Maxx, Chipco Signature) have been shown to not be effective suppressants.

Cultural: raise mowing height of cut; balance fertilizer nutrients internally in the plant; may be more prone on newer greens <10 years old.

Reference: Jason Stahl. February 2013. Down with PRD. Golf Course Industry25(1): 38-42.

Pythium root rot (PRR):

P. Graminicola, P. Ultimum, P. torulosum, P. Vanterpoolii, plus other species

Driven by wet soil plus stressed plants; and hot or cold temperature has nothing to do with pathogenicity. Often occurs prior to pythium blight on surface shoots.

Symptoms: irregular chlorotic, yellow or orangish patches or streaked areas with rapid dieback of foliage; shallow water-soaked root system that is tan in color or rotted, with no root hairs production and reduced root volume mass. No foliar mycelium.

Do not over-irrigate and make sure drainage is functioning. Occurs during climatic stress conditions; attack the roots and causes black symptoms.

Cultural: raise HOC, spoon feed nutrients, alternate mowing and rolling, aerify, improve drainage. Manage air flow; reduce shade limitations. Avoid high nitrogen fertility.

Fungicides: Segway or Terrazole or Banol as curative with aeration; Banol, Aliete, Viceroy, Chipco Signature, Subdue MAXX, or Segway as preventative.

Citations: J. Kerns and L. Tredway. 2011. Pythium root dysfunction of creeping bentgrass greens. GCM 79(1):130-137.

J.P. Kerns, M.D. Sokia, and L.P. Tredway. 2009. Preventative control of *Pythium* root dysfunction in creeping bentgrass putting greens and sensitivity of *Pythium volutum* to fungicides. *Plant Disease* 93:1275-1280.

L. Tredway. 2011. Pythium myths. *Golf Course Industry* (www/golfcourseindustry.com/disease-digest-52411-pythium-myths.aspx?List_id-342)

R. Woelfel. June 2018. Know your Pythiums. *Golf Course Industry Magazine*.