

Management of Pythium

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Pythium, Grease spot, Cottony blight, Damping off, Root rot — whatever the name, few turf diseases can strike so swiftly and disrupt the viability of a turfgrass sward. During the day or night, oftentimes within a period of a few hours, Pythium can effectively destroy large areas of a stand of turf. Nearly all types of turfgrasses are susceptible, only the improved bermudagrass cultivars are resistant or to some degree tolerant of Pythium. No varieties of bentgrass or ryegrass are known to withstand the disease without the aid of some fungicide treatments. Areas of annual and perennial ryegrass, annual bluegrass, and the creeping and colonial bentgrasses left untreated by preventative fungicides during periods of high Pythium disease pressure simply will not survive an outbreak.

Pythium remains year-round in the turfgrass canopy, feeding on thatch and decaying organic matter and is therefore a saprophyte. It waits in the upper soil and thatch layer for a few primary keys, a series of proper conditions to become active. It's usually called a warm climate disease but Pythium causes the most severe problems when temperatures in the cooler humid areas reach daytime highs of 85°F to 95°F and nightly lows range above 70°F.

Pythium can be an extremely severe disease, commanding attention even before it is actually seen. The thinking Golf Course Superintendent uses several primary keys such as air and soil temperature, humidity, nutrition levels, soil moisture and water movement channels, as well as the calendar to clue himself on the likelihood of Pythium. The calendar is among the easiest of clues - periods of tie, be they days, weeks, or even months are often criteria of prediction. These can be and often are repetitious from year to year when forecasting certain periods of disease pressure. In the Chicagoland area as well as the upper Midwest the months of July and August are the periods when conditions most often favor Pythium.

These conditions are a combination of very humid, stagnant air masses, days and nights are unusually calm and hot. Large quantities of water are available to the turf - H₂O artificially added through irrigation and the infrequent rains that can be very heavy and add as much as 7" of water to turf that should already be near field capacity.

Geography and topography have a direct relationship on water movement as well as air movement. Stagnant air masses, often with hot, moisture laden air, are important contributors to the Pythium inoculum. Heavy, dewy mornings when there is just no trace of a wind, **those** are the times when Pythium is likely to surface. Add to that the water from nightly irrigation and/or rainfall and the recipe becomes just right.

Many of the older, metropolitan golf courses were constructed on flat, poorly drained areas surrounded by dense, mature stands of trees. Moisture and air just do not move readily, and Pythium disease pressure is often very high. Drainage is very important to disease control, meaning drainage both of air **and** water.

Nutrition also plays a big factor in any disease prevention regimen. While some readily available nutrients may help suppress some diseases, at the same time other disease pathogens are using some of those same nutrients for their viability. Pythium development is favored in lush, highly succulent turfs which have been overfed with nitrogen.

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In addition to the aforementioned, temperatures usually need to be high although Pythium may also occur during wet, cool, and even cold weather. It is not so easily identified and damage is not as readily noticed. Damage is most severe when high temperatures are coupled with high levels of moisture and high levels of nitrogen.

SYMPTOMS

Visually the easiest symptoms to spot are the matted "grease spots" of collapsed plants. These spots often have a white cottony mycelium that remains active and visible so long as moisture is readily available. This mycelium can be and often is spread by foot traffic, hoses, mowers, and water going down natural drainage channels. This produces the streaked appearance so often shown as examples of Pythium damage. These diseases patches can coalesce and form large sections of devastated turf in less than twenty-four years — leaving dead turf areas of light brown or tan.

The size of these areas can be limited by the drying effect of a bright sun, a strong wind, cooler temperatures, or a change in humidity; any of which can cause the cessation of Pythium blight activity. Since as a saphrophyte, Pythium is "always there", a reoccurrence of the correct prime factors may again trigger the disease activity at any time.

CONTROL

Although there is no good substitute for good cultural practices, these alone will not prevent incidences of Pythium blight. A preventative fungicide program is absolutely essential. During periods of hot, humid weather the disease acts too swiftly, and when diagnosed, too often the damage has been done. Tim-

ing and anticipation are very important when scheduling preventative fungicide applications. Constant monitoring of the environmental factors will aid the decision making process for initiation of preventative fungicide spray applications. Briefly these factors include: Day temps over 85 °F; Night temps over 70 °F; High moisture and humidity; Lush, nitrogen rich turf; Poor air circulation. Because of our geographic location (close to a river, on a flat, poorly drained plain; heavy clay soil) it is not uncommon for Pythium to be seen several days or even weeks before some other area clubs.

From past experience we have learned to begin a preventative Pythium fungicide program for greens and tees in June and continue on a weekly basis until late August. Each week these areas receive contact fungicide treatments (usually 4oz/m chloroneb). The fairways receive two or three applications of the newer systemic Pythium control fungicides - more if necessary.

These recently developed systemic type Pythium control fungicides have fostered enormous interest, for both their longevity (up to 21 day control) and the potential for development of fungicide resistance. While a few rumblings have been heard regarding resistance of Pythium to these systemics (metalaxyl in particular) there is no evidence of Pythium resistance to it or propamocarb.

While metalaxyl and propamocarb are classified as systemics, their modes of action within the plant are different:

METALAXYL	PROPAMOCARB
site specific	affects cell membrane
emulsifiable concentrate	water soluble

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National Golf Foundation 1983 Golfer Profile Survey

NORTH PALM BEACH, Fla. — The typical American golfer is 48 years old, reports an average score of 87, lives in a household with an annual median income of \$37,000 and spends over \$500 a year on green fees and golf equipment, according to the National Golf Foundation's 1983 Golfer Profile Survey.

"The survey reveals some interesting facts and figures on golfers and their golfing habits," reports Sandra Eriksson, NGF director of research. "Overall, it indicates that American golfers are more mature, affluent and better educated than the population as a whole."

The survey also covered the number of rounds played, reasons for taking up the game, percentage of rounds using a golf car and clothing and golf shoe purchases.

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(Turf-Cal Cont'd.)

before Turf-Cal application to reduce heavy thatch. Verticut to make room for new growth. Bring the soil to surface to favor new seedlings. Avoid overseeding in heavy thatch. Aerify yearly as necessary to keep thatch from accumulating.

5. **Overseed as needed.** Repeat introduction of seed of the desired cultivars until uniform stand is produced. Seed 5-20 pounds per acre when conditions are suitable. Repair worn areas and resod critical areas. Use caution in treating newly seeded areas. Use lower recommended rates of Turf-Cal on new seedlings and keep root zone moist.

6. **Apply Turf-Cal in late summer or early fall.** Use Turf-Cal before September 15th when possible because days become shorter and light intensity diminishes. This encourages cool season grasses and new seedlings to fill in during fall, winter and spring. Apply uniformly. Avoid skips and overlaps.

7. **Maintain effective soil arsenic levels.** Continue program by applying supplemental Turf-Cal at maintenance rates annually in the fall.

8. **Emergency phosphorus supplement:** If unusual conditions indicate emergency correction is needed, weakened **Poa annua** can be improved by the application of 1/8 to 1/4 pound per 1,000 sq. ft. of soluble phosphorus as a liquid fertilizer. Do not use more than needed. Avoid this procedure if possible.

9. **Eliminate all plant material.** Turf areas composed of high percentage of **Poa annua** may be killed with Round-up. Cultivate and reseed to desired cultivars. The new stand of grass may be protected by use of Turf-Cal.

10. **Special note on greens.** Use lower rates on greens where sand predominates in the root zone. The base exchange capacity is low on sand greens.

Equipment should be carefully calibrated; turf managers should understand the limitations, the requirements and need for continuity to successfully rid **Poa annua** and establish desirable grasses.

The elimination of weedy grasses and the establishment of fine turf requires a knowledgeable, dedicated superintendent who communicates effectively with his membership.

(Pythium Cont'd.)

portunity to interchange these fungicides. For instance, use of metalaxyl in early July followed by an application of pro-pamocarb 2-3 weeks later in a preventative fungicide program would tend to elude any possible Pythium resistance to either fungicide.

Managing Pythium involves comprehension of a series of variables, both cultural and physical. Some are within the control of the Golf Course Superintendent and he can help himself maintain a high level of Pythium management with a strong awareness of those variables bolstered with an active Pythium preventative fungicide program. The blight strikes too swiftly and destructively to ignore it's consequences.

I'll leave you with a word ... ANTICIPATE.