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Turf Grass TRENDS

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Late summer leaf spots and leaf blights

by Dr. Eric B. Nelson

Leaf Spots on Kentucky Bluegrass. Up close the first sign of leaf spots and blights is usually a change in color from a healthy green to purple or purplish-gray. Soon leaves turn tan to brown and sheathes turn from brown to black.

DURING THE WARM, HUMID MONTHS of late summer, many fungi are capable of causing various leaf-spotting, leaf-streaking, and leaf-blighting symptoms on turfgrasses. Literally dozens of causal fungi have been identified as problems on lawn and golf course turf under these conditions. All of these fungal pathogens are characterized by a need for warm temperatures and excessive moisture. This article covers the more commonly-observed late summer foliar diseases that occur on residential, commercial and golf course turf—with descriptions of their symptoms, biology and, where possible, recommendations for cultural or chemical controls.

Brown Patch

DISEASES ON COOL-SEASON GRASSES falling under the descriptive term "Brown Patch'"can be caused by a number of Rhizoctonia species: *R. solani, R. oryzae*, and *R. zeae*. All three pathogens can be quite damaging under conditions of high moisture and high relative humidity. Diseases caused by *R. solani* are most damaging when nighttime temperatures are greater than 65–70°F (18–21°C). Diseases caused by *R. oryzae* and *R. zeae* are most damaging when daytime temperatures are between 85 and 95°F (29–35°C).

Visual symptoms arising from *Rhizoctonia* infections may differ—depending on turfgrass species, cutting height, the degree of fertilization, irrigation, and other maintenance procedures. Despite these different visual manifestations, these symptoms are always found on the leaf blades and leaf sheathes. Although it can occur, little is known about root infections by species of Rhizoctonia.

R. solani biology and symptoms

ON CLOSELY MOWED, wet cool-season grasses, infection by *R. solani*, the most commonly observed of the three species, results in large patches of blighted grass that rapidly appear following prolonged periods of rainfall or high humidity, above 50%, and high nighttime temperatures, above 65°F (18°C). *R. soloni* infestations can occur over a wide range of air temperatures, generally from 60–90°F (15–32°C).

During the initial phase of the infection, the blighted leaf blades and leaf sheathes may take on a purple to purplish-gray color. As the leaf blight progresses, the leaves rapidly turn to a color range from tan to brown. Sheath blights turn to a color range from brown to black.

Often—in the morning dew, following periods of high nighttime temperatures and high humidities—a dark purplish to gray-brown border may appear around *R. solani*-blighted areas. This patch margin is frequently referred to as a "smoke ring." It is a distinctive visual symptom. It occurs when the pathogen is actively growing and infecting leaf blades—in a widening pattern from the original site of infection. This synchronous infection of leaf blades around the periphery of the patch results in a uniform wilting of these marginal plants. Occasionally, during periods of heavy dew, an abundant fluffy mycelium may be evident around the periphery of these patches.

On cool-season grasses that are cut at a two-inch height or higher (i.e., perennial ryegrass, Kentucky bluegrass, and tall fescue), the large patches will develop more slowly. They can range in size

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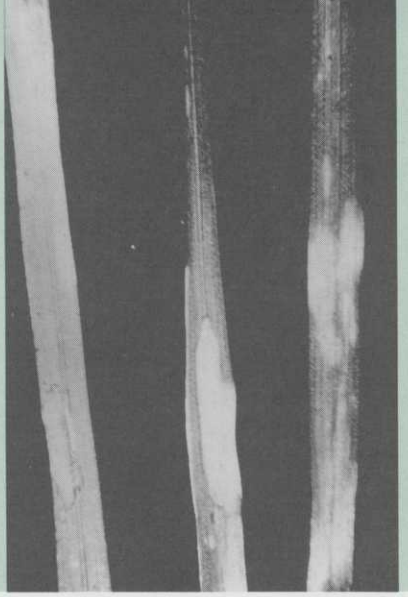
Brown Patch

Brown patch on tall fescue. Brown Patch on a tall fescue lawn may be caused by one of several varieties of Rhizoctonia. Symptoms may appear following a prolonged period of rainfall or high humidity. Later in the disease process large areas of blighted turf appear.



Rhizocronia on Kentucky Bluegrass. Rhizocronia on Kentucky Bluegrass produces lesions that are generally tan and irregular in shape with a dark brown border. On tall-cut turf, these lesions can be diagnostic. The large size of the lesions produce completely destroyed leaves on short-cut turf, so there isn't enough leaf area for their diagnostic appearance.

from several inches to several feet in diameter. Generally, no smoke ring is evident around the periphery of the patch. Patches will often appear sunken, as the leaf blades wilt and collapse to the soil surface.

Tall-cut turf can exhibit the same leaf and sheath blighting seen on short-cut turf, as well as individual lesions, which are evident on leaf blades and sheathes. Lesions are generally tan and irregular in shape, with a dark brown border. These individual lesions are particularly symptomatic on tall fescues, where the lesions can be quite diagnostic. On tall-cut turf, this individual lesion symptomology may be more numerous—over larger areas of turf than the full-scale blighted areas. Seen on short-cut turf, and, if observed early in the infection cycle, they may give the turfgrass manager more lead time to take corrective actions.

R. zeae biology and symptoms

SYMPTOMS CAUSED BY INFECTIONS from *R. zeae* are less distinct than those caused by *R. solani* infections. *R. zeae* infections are most prominent at air temperatures over 90°F (32°C). On close-cut creeping bentgrass, symptoms from *R. zeae* infection may consist of gray-brown or yellow arcs or circles of blighted turf. The characteristic "smoke ring" is usually not evident.

On higher-cut tall fescue turf, leaf blade and leaf sheath symptoms may appear similar, if not identical with *R. solani* induced symptoms. However, those arising from *R. zeae* infections will occur at the higher air temperatures, often over 90°F (32°C). Occasionally, during high temperature periods, a cream-colored mycelium of *R. zeae* may be observed growing from infected leaf blades or sheathes.

High nitrogen fertility is less of a problem than thought

RHIZOCTONIA DISEASES HAVE GENERALLY been considered to be more severe under high nitrogen fertility conditions. Traditionally, this has been attributed to the increased succulence of the foliar tissues, under high nitrogen fertility, making them more susceptible to infection; however, recent research results show that excessive rates of nitrogen may not lead to increased Brown Patch severity. In some cases, nitrogen applications may actually suppress Brown Patch diseases.

Changing management practices can help

SINCE PROLONGED PERIODS OF FREE WATER on the surface of the leaf are required for the most severe outbreaks of Brown Patch, any management strategy that will reduce the leaf wetness period will reduce the damage from Rhizoctonia species. These practices would include:

1. MAINTENANCE OF GOOD SURFACE and subsurface drainage to remove excess water after rainfall or irrigations.
2) WATERING EARLY IN THE DAY to allow the leaf canopy sufficient time to dry.
3) REMOVING DEW from the turfgrass foliage can be particularly important on short-cut turf.
4) INCREASING THE AIR FLOW around disease-prone sites by selective removal of trees, shrubs, etc.
5) THE USE OF WETTING AGENTS to reduce water accumulation on leaf blades and to ease the movement of water down through the soil profile.

A new cultural practice that is proving helpful in reducing damage from Rhizoctonia infections is the application of compost-amended topdressings to increase microbial activity antagonistic to Rhizoctonia. This strategy may be helpful in reducing the concentrations of other pathogenic fungi. Research has shown that these compost-amended topdressings can reduce the occurrence of Red Thread and Pythium Root Rot diseases.

Nearly all cool-season turfgrasses are susceptible to infection by Rhizoctonia species; however, some varieties of fine fescue, tall fescue and perennial ryegrass are particularly susceptible. In areas of the country where Rhizoctonia species cause considerable damage, a local recommendation should be obtained for the varieties best adapted to your area.

As a last resort strategy for the control of Brown Patch, fungicides may be required to reduce or eliminate the progression of the disease. Many fungicides are labelled for

Brown Patch control. However, due to the extreme variability in the sensitivity of Rhizoctonia species to these various fungicides, no single fungicide may be effective in controlling Brown Patch under all conditions, at all locations and for prolonged periods. Trial and error may be the best approach in choosing a group of successful Brown Patch fungicides. Tank mixing contact and systemic fungicides with their different modes of action may provide the broadest and most successful means of controlling these diseases.

■ Cochliobolus Diseases

THE COSMOPOLITAN, SEED-BORNE PATHOGEN, *Cochliobolus sativus* (= *Bipolaris sorokiniana*), causes a wide range of disease symptoms on essentially all cool-season grasses, ranging from seedling blights to leaf spots, blights and root and crown rots on established turf. The most conspicuous symptoms are the leaf spots and leaf blights *(see photo page 1)*. These diseases were formerly lumped under the category of "Helminthosporium leaf spots and blights."

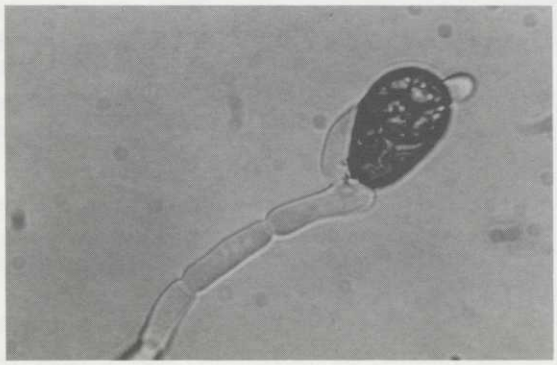
C. sativus biology and symptoms

ON MATURE KENTUCKY BLUEGRASS PLANTS, leaf spots resulting from *C. sativus* infections are quite noticeable, appearing as small, tan circular spots with dark brown or purple borders. As the lesions increase in size and number, leaf blades begin to turn yellow and the blades become extensively blighted. As the disease progresses, crowns and roots become invaded, resulting in a black to reddish-brown appearance on rotted tissues. Once root and crown infections occur, large areas of turf may rapidly die in a patch-like pattern.

Cochliobolus sativus can produce abundant dark-brown multicellular spores called conidia on diseased tissues, particularly at temperatures of 80–85°F (27–29°C). Once formed, conidia may be dispersed by wind, water, traffic or grass clippings, the most common means of spreading the infections. Under warm and wet or humid conditions, these conidia can germinate on a susceptible grass blade within a matter of minutes and generally require as little as 10 hours to infect the plant. Germinated conidia give rise to dark-brown mycelium easily observed with a microscopic examination of the infected plant tissues.

Effects may differ with different conditions

ALTHOUGH THE FAMILIAR FOLIAR INFECTIONS most commonly occur in the spring under wet conditions, the air temperatures can dramatically affect the foliar symptoms that develop throughout the season. For example, at temperatures of 70°F (21°C) or less, only slight leaf spotting and no leaf blighting are observed. At temperatures of 75–80°F (24–27°C), considerable leaf spotting and some leaf blighting can be observed. As temperatures rise to around 85–90°F (29–32°C), little or no leaf spotting can be observed, however, severe leaf blighting may prevail. At this stage, root and crown rots may become evident. At temperatures of 95°F (35°C) or greater, severe leaf blighting and severe crown and root rotting can occur resulting in the extensive destruction of established turfgrass stands. If left uncontrolled, the disease will increase in severity during successive seasons.



Bipolaris spore germinating. Given the right conditions, the abundant spores of *C. sativus* can germinate rapidly and spread infection to new areas. The most common ways the infection is spread include the wind, water, traffic, and grass clippings.

Several factors may alter the susceptibility of turfgrasses to infection by *C. sativus*. Elevated nitrogen levels, excessive nighttime irrigation, inappropriate mowing height, thatch accumulation, and the use of some herbicides and fungicides may increase disease development in Kentucky bluegrass turf. Periods of drought stress will also enhance disease severity. Drying and wetting cycles appear to increase the germination of *C. sativus* conidia and increase the chances of plant infection. Day length has also been shown to affect the severity of foliar symptoms. Generally, as day-length shortens, symptoms on infected leaves become more severe with lesions enlarging and becoming joined by yellow streaks or entire leaf blades becoming blighted.

Planting resistant varieties is effective

NEARLY ALL COOL-SEASON GRASSES can be affected by *C. sativus* diseases to some extent, but some species, and varieties within a species, are more vulnerable than others. Many cultivars of Kentucky bluegrass and quite a few of the ryegrasses have been bred for and exhibit good to excellent resistance to *C. sativus* diseases. However turfgrass managers should double check with local experts when selecting *C. sativus* resistant species and varieties because this resistance can vary from one region to another.

Although the use of resistant varieties can greatly reduce the severity and frequency of *C. sativus* disease

Generally, as day-length shortens, symptoms on infected leaves become more severe with lesions enlarging and becoming joined by yellow streaks, or entire leaf blades becoming blighted.

infestations, under adverse weather conditions and when the turf is under stress from other problems *C. sativus* infestations can be very opportunistic. Under these conditions, especially when the turf is under stress from any of the root damaging diseases, *C. sativus* infestations can be very difficult to control.

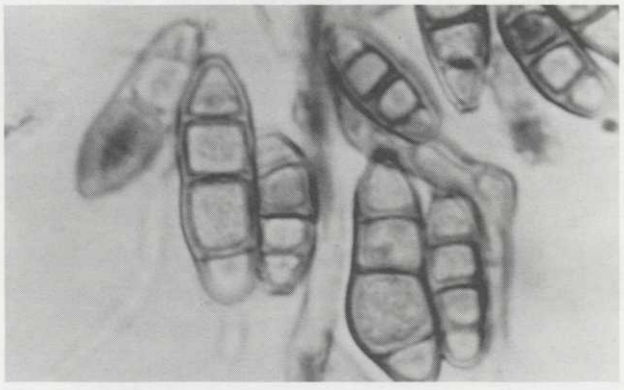
Recommended strategies for controlling *C. sativus* diseases

THE FOLLOWING ARE RECOMMENDED control strategies for Cochliobolus leaf spots and leaf blights:

1. USE DISEASE-RESISTANT VARIETIES adapted to your area.
2. AVOID THE EXCESSIVE USE OF QUICK-RELEASE nitrogenous fertilizers, particularly in the spring.
3. RAISE MOWING HEIGHTS to at least two inches and maintain the sharpness of mower blades.
4. WHERE POSSIBLE, REMOVE CLIPPINGS since these are a major source of inoculum.
5. REDUCE THATCH ACCUMULATION through periodic topdressing applications or by mechanical dethatching techniques.
6. AS A LAST RESORT, APPLY FUNGICIDES such as anilizine, chlorothalonil, iprodione, mancozeb, thiram, or vinclozolin. Check label instructions for rates and application frequencies.
7. AVOID THE USE OF STEROL-INHIBITING triazole fungicides, since these will predispose the plant to infection.

■ Curvularia Blights

MANY SPECIES OF CURVULARIA cause leaf spots and leaf blights on cool-season turfgrasses. The most common species are *C. geniculata, C. intermedia, C. inaequalis, C. lunata, C. protuberata,* and *C. trifolii*. All cause diseases on Kentucky bluegrasses, creeping red fescues, and creeping bentgrasses. *C. intermedia* is also pathogenic to perennial ryegrasses. Symptoms from Curvularia infections range from seed rots and seedling blights to root and crown rots as well as extensive leaf blights on mature turfgrass stands. These pathogens closely resemble *C. sativus* in their host preference, disease habit, and microscopic appearance, but they are generally less damaging.



Curvivaria spores. Curvularia species produce distinctive three and four-celled conidia, which can germinate rapidly on dead tissue. On mature turf, look for die-back and progressive yellowing from the tip of infected blades.

. . . tips appear to die back from the tip with a progressive yellowing down the leaf blade. The affected portions of the leaf blade shrivel and die, turning a brown to gray color.

Curvularia biology and symptoms

ON MATURE TURFGRASSES, symptoms appear as a general decline of the turfgrass stand. Upon closer examination of grass blades, tips appear to die back from the tip with a progressive yellowing down the leaf blade. The affected portions of the leaf blade shrivel and die, turning a brown to gray color. Sometimes on Kentucky bluegrasses and creeping red fescues, a reddish-brown border delimits the diseased portion of the leaf blade from the healthy portion.

Curvularia species are most damaging at temperatures greater than 85°F (29°C), higher than the temperature optimum for Cochliobolus diseases. Also, Curvularia diseases generally require a host compromised from other stresses to cause significant levels of damage. Since Curvularia species are ubiquitous in turfgrass thatch, this is the main source of inoculum for foliar and crown infections. Many species may be carried with the seed.

Curvularia species produce very characteristic three to four celled conidia that are curved with an enlarged cell in the middle. Both conidia and mycelium are dark brown in color and are easily recognized under the microscope. Conidia are produced in abundance on dead tissue and can quickly germinate to reinfect susceptible leaf and sheath tissues.

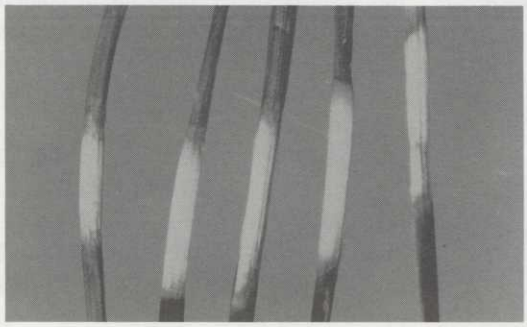
Conditions favoring Curvularia diseases include prolonged periods of leaf wetness and high air and soil temperatures; high relative humidities; excessively low mowing heights; excessive fertilization; excessive thatch accumulation; and the use of some herbicides and fungicides.

Control strategies are the same as *C. sativus* diseases

CONTROL STRATEGIES for Curvularia diseases are generally the same as for Cochliobolus diseases. Because this disease infects turfgrass stands under a narrow set of conditions, chemical control is often not necessary, particularly for the occasional infestation. If the site has shown a history of Curvularia disease problems, then the institution of the non-chemical control strategies should be sufficient. In the case of

persistent infections of Curvularia, turfgrass managers should make a concerted effort to ensure that other stress factors, such as low-level, chronic Pythium or Necrotic Ring Spot infestations, are controlled.

Nigrospora Blight



Nigrospora lesions on Kentucky Bluegrass. The lesions produced by Nigrospora Blight on Kentucky Bluegrass can be distinguished from Dollar Spot by the absence of the hour-glass shape of the lesions produced by Dollar Spot. As the infection progresses, the color of infected leaves, which is tan in contrast to the off-white color of plants infected with Dollar Spot, provides another diagnostic clue.

NIGROSPORA BLIGHT, caused by *Nigrospora sphaerica*, is an uncommon disease in most parts of the country, but it can be found frequently in warmer locations along the eastern seaboard and the eastern sections of the Transition Zone. The disease is a problem on perennial ryegrasses and Kentucky bluegrasses often occurring on installed sod. It occurs during the hot humid months of midsummer, and is frequently mistaken for Dollar Spot or Pythium Blight.

Nigrospora biology and symptoms

IN THE INITIAL PHASE OF THE INFECTION, lesions form on leaf blades that appear very much like Dollar Spot lesions. The lesions appear near the middle of the leaf half way down from the tip. The lesion spreads across the blade width similar to Dollar Spot lesions, but it does not appear to have the pinched hour-glass shape so diagnostic for Dollar Spot. The upper and lower margins of the lesion may have a brown to dark purple border. As the infection progresses, the top portion above the lesion can take on a distinct dark purple color. This color will fade and the blighted leaf takes on a light tan color unlike blighted Dollar Spot leaves that have a decidedly off-white appearance.

As more leaves become infected small spots three to five inches in diameter appear. In the turf, these small spots are generally twice the size of initial Dollar Spot symptoms. The spots rapidly expand to 6–10 in., and may coalesce into large areas of blighted turf. In the most advanced stages of Nigrospora infections, the affected area appears as an uniformly blighted area of turf with sections where the blades have collapsed.

Under very warm, humid conditions, abundant white foliar mycelium may be visible on grass blades—where new infections can then occur wherever the mycelium contacts uninfected grass blades. Besides the conspicuous mycelium associated with blighted patches of turf, Nigrospora produces shiny black conidia that are observable under a microscope. The white mycelium can be incorrectly identified as Pythium infestations.

Periods of warm humid weather accompanied by nighttime temperatures between 70–75°F (21–24°C) and free water on the surface of the foliage may result in severe outbreaks of Nigrospora blight. This disease is also a particular problem on turf growing in very dry or infertile soils. Turfgrasses are generally not affected by *N. sphaerica*, if they are not weakened by other stresses. Increasingly, it is a problem on Bluegrass sod installed over poorly prepared subsoils.

Strategies for controlling Nigrospora Blight

The following are recommended control strategies for Nigrospora Blight:

1) MAINTAIN ADEQUATE AMOUNTS OF BALANCED fertilizers.
2) AVOID MOISTURE STRESS BY CONSIST IRRIGATING thoroughly and infrequently.
3) AVOID NIGHTTIME WATERING.
4) DO NOT MOW WHEN THE GRASS IS WET.
5) AVOID AS MUCH PHYSICAL OR CHEMICAL STRESS TO the turf as possible.
6) IDENTIFY AND CONTROL OTHER STRESS producing conditions that reduce the turf's general health.
7) THE USE OF FUNGICIDES designed to control other diseases such as Dollar Spot at labeled curative rates may reduce the severity of Nigrospora Blight *(Note: no fungicides are specifically labelled for Nigrospora Blight.)*

Pythium Blight

PYTHIUM BLIGHT, also known as spot blight, grease spot, cottony blight, and foliar Pythium, is caused by several different species of Pythium. At least six species have been

Pythium turf damage. At least six different Pythiums may be the culprit behind this kind of extensive damage. Like other leaf blights, warm and wet conditions that produce prolonged leaf wetness provide ideal conditions for Pythium outbreaks. This photograph shows typical damage spread by the movement of water.

There is a difference

Nigrospora on turf. Often mistaken for Dollar Spot and Pythium Blight, Nigrospora Blight is a less common disease. It is, however, becoming more of a problem in the warmer parts of the East Coast—especially on bluegrass sod installed over poorly prepared subsoils.

Pythium mycelium on turf. At first glance, the mycelium of Pythiums and Nigrospora look similiar; however, a closer look reveals that the *Pythium is growing from the bottom up,* while the Nigrospora grows from the top down. Also, by the time the mycelium is present, damage from Pythiums can be much more massive than damage from Nigrospora.

implicated in this disease. They include *P. aphanidermatum, P. graminicola, P. torulosum, P. vanterpoolii, P. arrhenomanes*, and *P. ultimum*. Under high temperatures of late summer, *P. aphanidermatum*—and possibly *P. arrhenomanes* and *P. graminicola*—are the predominant causes of Pythium Blight. The other species, except for *P. myriotylum*, are involved in a cool season Pythium Blight that occurs in some locations.

Pythium species symptoms

ALL OF THESE PYTHIUMS can cause nearly identical symptoms on infected turfgrasses, and the exact identity of the causal agent can only be determined by microscopic examination of infected tissues. Currently, all cool-season turfgrasses are susceptible to infection by Pythium species.

On close-cut turf, symptoms first appear as small circular to irregularly-shaped patches of water-soaked, dark-colored plants. Individual leaf blades generally become slimy in appearance. Patches may range from less than one inch to greater than five inches in diameter. Under high temperatures and abundant moisture, these patches quickly fade to a light brown or reddish brown, as the leaves wilt and die. Because of the tremendously disruptive manner that Pythiums attack turf, these small patches can rapidly coalesce to form large areas of dead or dying turf. In the early morning hours, when temperatures are warm and relative humidities are high, abundant mycelium can be found associated with the patches. During intense Pythium Blight epidemics, root and crown infections can also occur, resulting in the rapid destruction of a turfgrass stand.

Temperature and moisture are critical in Pythium infections

AIR AND SOIL TEMPERATURES and moisture levels are the primary deciding factors of the severity of Pythium blight epidemics. Most severe Pythium blight outbreaks are associated with hot, rainy weather and high nighttime temperatures that ensure prolonged leaf wetness periods.

Generally, the appearance of Pythium Blight follows a period of hot days, and is preceded by a period of wet, warm and humid nights. Specifically, studies have shown that Pythium Blight outbreaks may be predicted by monitoring selected temperature and relative humidity levels. These include a maximum daily temperature of greater than 86°F (30°C) followed by a 14-hour period where the relative humidity exceeds 90% and the temperature does not fall below 70°F (21°C). This set of conditions is often met when a hot day, or days, is followed by a prolonged nighttime rainfall.

Aside from temperature and moisture effects on Pythium Blight incidence, other stress factors, such as unbalanced fertility, may also affect disease severity. Generally, excessive quick release nitrogen fertilization will markedly increase the severity of Pythium Blight. Calcium deficiencies may also increase the susceptibility of turfgrasses to Pythium Blight damage. Both conditions can have detrimental effects on turf root growth or regeneration.

Pythium species biology

PYTHIUMS SURVIVE PRIMARILY as perennial infections in turfgrass roots, but they also survive in thatch layers. Pythiums produce abundant oospores in infected tissues that allow it to survive in turfgrass roots and thatch. A unique characteristic of Pythium species is that they produce spores that can swim in free water. These swimming spores are released from sporangia produced in the leaf crown and root tissues. The presence of these swimming spores, coupled with the abundance of foliar mycelium typically associated with diseased patches, ensures easy spread of this disease from one location to another. As a result, Pythium Blight has the distinction of being perhaps the fastest developing, and the most devastating, of all fungal diseases of turfgrasses.

Control strategies for Pythium infections

AS WITH RHIZOCTONIA DISEASES OF TURFGRASSES, water management is one of the keys to effective control of Pythium Blight. This should be accompanied by practices that minimize plant stress, such as reducing thatch, improving surface drainage with wetting agents, the use of sand-based

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Leaf Blights *continued from page 6*

topdressing materials and improving air flow where possible, while maintaining balanced fertility. However, because of the explosive nature of this disease, fungicides are usually relied upon for effective disease management.

Fungicides are important for Pythium management

MANY FUNGICIDES ARE AVAILABLE for the control of Pythium Blight. Nearly all of these fungicides, however, are only effective against Pythium species diseases. Therefore, an accurate diagnosis is essential for effective control. Contact fungicides available for Pythium Blight control include chloroneb (various trade names), ethazole (Koban®, Terrazole®), and mancozeb (various trade names). Systemic fungicides labeled for Pythium species control include metalaxyl (Subdue®), propamocarb (Banol®), and fosetyl Al (Aliette®).

Generally, these fungicides are effective in suppressing Pythium Blight, but the level of control and the duration of that control will vary. Also, the duration of control by a particular product will vary considerably, depending on the conditions at each site. When using a long-term fungicide preventive program, their applications should always be rotated among the various available materials to avoid the development of a fungicide-resistant population of Pythium. ■

LETTERS TO THE EDITOR

Readers who wish to comment on any aspect of the articles, news items, or commentaries published in *Turf Grass Trends,* or on any issues or concerns raised by them, should do so by writing to:

TURF GRASS TRENDS
2070 Naaman's Rd., Suite 110
Wilmington, DE 19810-2644

Please include a return address. Where appropriate, and as space allows, we will respond to the letters we publish. We reserve the right to edit all letters. All published letters become the property of *Turf Grass Trends*.

ASK THE EXPERT

Have a question on any aspect of turf management? Send it to: Ask the Expert, Turf Grass Trends, 2070 Naamans Rd., Suite 110, Wilmington DE 19810-2644 or fax it to (302) 475-8450. If we can't answer your question, we will put it to the best available expert on the subject.

REGULATORY WATCH

Oregon fines Great Western for mislabeling seeds

THE OREGON DEPT. OF AGRICULTURE and Oregon State University have jointly brought the Great Western Seed Co. to task for mislabeling grass seed bags. The company was fined $81,000 for substituting uncertified seed for certified seed—the largest civil penalty to date for a case of its kind in Oregon. The company also was placed on one-year probation and its "approved certified warehouse" status was revoked for two years.

The case grew out of a customer complaint to the university, which handles the certification process. The company has issued a press release saying that it corrected the problems in question before the state investigation.

E.P.A. files suit against Miles

THE E.P.A. HAS FILED A CIVIL COMPLAINT AGAINST MILES, INC. for the alleged late reporting of tests that indicated that two of thier prominant pesticides might be potential human carcinogens.

In their complaint, the E.P.A. alleges that on two separate occasions Miles (formally named Mobay) failed to notify the agency, in a timely manner, when it became aware of test results that indicated that two of their products—Bayleton and Dylox—induced tumors in laboratory mice.

A section of FIFRA, the enabling legislation, requires that, if a company receives new contrary information about a product that is already registered, the company must submit the new data to the E.P.A. within 30 days. In the case of Bayleton (Triadimefon,) the E.P.A. claims that Miles failed to notify the E.P.A. for 27 months, and 10 months in the case of Dylox.

Notification act redrafted

THE NOTIFICATION CONTROL AND APPLICATION ACT OF 1991 will not be brought to the floor of Congress until next session. The redrafted U.S. Senate bill S.849 is designed to establish local registries for pesticide sensitive people and posting requirements that include homeowner-applied pesticides

The bill, that requires the states to establish registries for people who want advance notice of a neighbor's pesticide applications, would require 72 hours written notice to people on the registry. Also, the bill will expand posting requirements to include homeowners—with explanation of the posting requirements to be printed on the packaging. The posting would be required just prior to the application of the pesticide.

E.P.A. will investigate granular pesticides danger to birds

THE E.P.A. HAS SELECTED 14 OF THE 99 GRANULAR PESTICIDES, which it sees as posing the highest risk to bird populations. The 14 compounds will be tested in both corn fields and turf. They include aldicarb, bendiocarb, carbofuran, chlorpyritos,diazinon, disulfoton, ethoprop, ethyl parathion, fenamiphos, fonofos, isofensphos, methomyl, phorate and terbufos.

E.P.A. & Texas college offer hotline

THE FEDERAL ENVIRONMENTAL PROTECTION AGENCY and Texas Tech University in Lubbock, Texas, have been cooperating in offering a 24-hour, 365 day-a-year, toll-free pesticide information hotline. Last year the hotine served 40,000–50,000 callers. The majority of the calls concerned pesticide safety. Callers also can get quick answers on detecting pesticide poisionings, spill clean-up and disposal information, and what to do in the case of a pesticide poisioning. The Hotline number is **1-800-858-PEST(7378).** ■