FEATURE ARTICLE

There are Two Types of Anthracnose: Basal Rot and Foliar Blight

Peter H. Dernoeden

Anthracnose is caused by the fungus *Colletotrichum graminicola,* but some scientists believe that there may be more than one causal agent. The aforementioned fungus is a common saprophyte found colonizing thatch or dying plant tissues. Under conditions that remain unclear, however, *C. graminicola* behaves as a pathogen. Anthracnose is primarily a serious problem of annual bluegrass (*Poa annua*) and creeping bentgrass (*Agrostis stolonifera*) turf grown on golf courses. Anthracnose also has been reported to attack creeping red fescue (*Festuca rubra*), perennial ryegrass (*Lolium perenne*), and Kentucky bluegrass (*Poa pratensis*). The latter species, however, are seldom damaged severely. The fungus may cause either a foliar blight or a basal rot. Foliar blighting generally occurs during periods of high temperature and drought stress. Foliar blight is a distinct type or phase of anthracnose, which may or may not progress into basal rot. Plants affected by anthracnose also may be invaded by other disease agents, including those causing leaf spot, summer patch, or *Leptosphaerulina* blight.

The foliar blight phase of anthracnose which occurs during high temperature periods in summer, causes a yellowing or a reddish-brown discoloration and eventually a loss of shoot density. The distinctive fruiting bodies (i.e., acervuli) with protruding black hairs (i.e., setae) can be observed on green and discolored leaf blade or sheath tissue. The presence of large numbers of acervuli on dead tissue in thatch does not always indicate that healthy plants also are infected. Therefore, **it is important to carefully look on green or discolored tissue of living plants for the distinctive fruiting bodies**. For a positive diagnosis, send samples to a lab that specializes in turfgrass diseases. Most land grant universities provide good diagnostic services. The foliar blighting phase is easier to control, and perhaps is less common than basal rot in some regions.

Basal rot anthracnose can be extremely destructive to putting greens. Basal rot has become more commonplace in recent years, and now ranks as one of the most important diseases of greens. The increased occurrence of basal rot in creeping bentgrass can be attributed to the common practice of mowing extremely low, maintaining low nitrogen fertility, and imposing abrasive cultural practices (such as frequent topdressing, brushing, vertical cutting, etc.) in the summer to increase green speed. The disease occurs at varying times of the year and may produce different symptoms on different hosts. **Basal rot in annual bluegrass occurs during both cool periods in the spring, and during warm to hot periods of summer**. Anthracnose can remain active in annual bluegrass throughout mild winters. **Basal rot generally does not appear in bentgrass before mid-June**. The pathogen is much more invasive if it enters stem tissue through wounds. The disease often is associated with close mowing, soil compaction, intense traffic, and low nitrogen fertility. Prolonged periods of overcast and/or rainy weather can trigger or intensify the disease. Shaded and wet sites are particularly vulnerable.

In late winter or spring, infected annual bluegrass turf may appear as orange or yellow spots about the size of a dime (18 mm). Individual plants may have both green, healthy appearing tillers, and yellow-orange infected tillers. The central, or youngest, leaf is the last to show the yellow-orange color change. Removal of all sheath tissue to expose the stem base reveals a water-soaked, black rot of crown tissues where roots and new buds are produced. By May, the dime-spot symptom is less common, and infected annual bluegrass plants coalesce into large, nonuniformly affected areas, which appear yellow or reddish-brown. Huge areas may thin or die-out completely. The disease at this point may be confused with *Helminthosporium* melting-out or red leaf spot. Basal rot is extremely difficult to suppress where it becomes a chronic, spring problem on annual bluegrass greens.

In the summer, affected turf initially develops a reddish-brown color and thins out in irregularly shaped patterns several feet or more in size. Occasionally, circular, gray-brown patches can appear on putting greens. Annual bluegrass plants often turn a brilliant yellow before dying, and this symptom can be confused with summer patch. **When discoloration or thinning is first observed, managers are advised to carefully look on stem bases for the infection mats**, which during the early stages of the disease appear as small (pinhead-sized), black "fly specks." This will involve removing the leaf sheaths to expose the whitish inner sheath tissues or stem areas. **There will be no tell-tale signs of the pathogen on leaf blade or sheath tissue during the early stages of basal rot**. In advanced stages, black aggregates of fungal mycelium often are present on infected stolons or stem bases of creeping bentgrass and annual bluegrass. The spore-bearing acer-

Continued on page 7

...Anthracnose...

Continued from page 3

vuli with short, black hairs and the black mycelial aggregates can be seen on stem bases and stolons without a hand lens. **Once acervuli develop on leaf sheath or blade tissue, the basal rot phase is advanced and plants generally die**. For mysterious reasons, the disease seldom attacks both annual bluegrass and creeping bentgrass on the same green or even on the same golf course.

MANAGEMENT

Basal rot is very difficult to control once the turf shows signs of thinning. This is especially true when annual bluegrass develops the disease in April or May. To alleviate basal rot, use walk-behind greensmowers and increase the height of cut immediately. Divert traffic away from affected areas by moving holes frequently. When the disease is active avoid topdressing, rolling, double mowing, core cultivation, brushing, vertical cutting, and other potentially abrasive practices. This is because **the pathogen often enters plants more easily through wounds**. In the autumn, after symptoms have dissipated, core cultivate and overseed. Water from irrigation should be applied only as needed to prevent wilt. A modest application of nitrogen (0.15 to 0.25 lb N/1000 ft^2 or 0.07–0.13 kg/100 m^2) combined with a fungicide, such as chlorothalonil (Daconil 2787®) tank mixed with either azoxystrobin (Heritage®), fenarimol (Rubigan®), propiconazole (Banner®), thiophanate (CL 3336® or Fungo 50®), or triadimefon (Bayleton®) should help reduce, but not eradicate, the disease. **For curative sprays, always include a high label rate of chlorothalonil in the mixture.** Two or more applications at a 10- to 14-day intervals may be required to arrest the disease.

Where basal rot is a chronic problem on greens, tees, or fairways, fungicides should be used preventively in combination with an improved nitrogen fertility program. Moderate nitrogen levels (3.0 lb N/1000 ft^2/yr or 1.5 kg/100 m^2/yr) are associated with less foliar blighting by anthracnose, especially when fungicides such as azoxystrobin (Heritage®), propiconazole (Banner®), thiophanate (CL 3336®, or Fungo®), or triadimefon (Bayleton®) are used preventively. Affected greens should be spoon-fed with nitrogen (i.e., 0.1 to 0.2 lb N/1000 ft^2 or 0.05–0.1 kg/100 m^2) **every 2 to 3 weeks throughout the summer. In extreme cases, greens that consist mostly of annual bluegrass that are chronically infected may have to be fumigated**. Similarly, for fairways and other large areas that are chronically affected it is best to eliminate annual bluegrass and renovate with less susceptible, regionally adapted grasses such as Kentucky bluegrass, perennial ryegrass, zoysiagrass, or bermudagrass. **Basal rot is less common in bentgrass grown on fairways and tees**. When treated during the early disease stages, bentgrass fairways and tees often recover in a reasonable amount of time. However, if the disease is allowed to progress to the point where stem bases are blackened before an appropriate fungicide(s) is applied it can be just as destructive as on greens.

Summary: It is important to note that there usually is no blighting of leaves during the early development of basal rot. The foliar blight phase can occur with or without progression to basal rot. Hence, there are actually two distinct types of anthracnose. Greens affected with anthracnose often respond favorably to chlorothalonil tank-mixed with one of the aforementioned penetrants. Where foliar blight or basal rot is a chronic problem, the aforementioned fungicides should be applied preventively, nitrogen should be applied at low rates throughout the summer, mowing height should be increased, and grooming practices should be avoided when the disease is active. Because they have no effect on *C. graminicola,* it is best to avoid applications of iprodione (Chipco 26019®), vinclozolin (Curalan®, Touche®, Vorlan®), and flutalonil (ProStar®) whenever anthracnose is active.

TURFAX™
© Ann Arbor Press
Introductory offer: $69.95 + shipping and handling
6 issues/year
Available by mail and/or fax

Ann Arbor Press
121 South Main Street
P.O. Box 310
Chelsea, MI 48118
Telephone: 800-858-5299; 734-475-4411
Fax: 734-475-8852
Email: turfax@aol.com