PURDUE UNIVERSITY

PURDUE EXTENSION

BP-108-W

Turfgrass Disease Profiles

Anthracnose

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Anthracnose is caused by *Colletotrichum graminicola*, a fungus that survives and thrives on dead and decaying organic matter. Although anthracnose may occur occasionally in turf maintained for athletic fields, professional landscapes, and residential lawns, it is primarily a disease of intensively managed annual bluegrass and creeping bentgrass used on golf courses. The anthracnose pathogen can cause two kinds of infections: a foliar blight (during stressful summer conditions), or a basal stem rot in annual bluegrass and creeping bentgrass (during cool, wet periods in spring). It is not clear how the foliar blight and basal stem rot diseases are related. The basal rot anthracnose is the more destructive phase of the disease.

Figure 1

Foliar Blight Anthracnose

A variety of summer stresses, including heat, drought, nitrogen deficiency, close mowing, and compaction, predisposes turfgrass to the foliar blight phase of anthracnose. Stress leads to premature decline and senescence, and limits the potential for turf recovery. There also is evidence that pre-emergence herbicides also stress plants, predisposing them to anthracnose infection.

Figure 2

The anthracnose fungus readily colonizes dead leaf blades under stressful conditions. When conditions are especially favorable, green leaf tissues and possibly crown tissues are infected, resulting in serious damage to the turf stand. Foliar blight anthracnose spreads largely by rain-splashed spores. Infection does not result in any visible surface mycelium.

From a distance, anthracnose-infected turf tends to have a yellow–orange cast and appears to lack its usual vigor. Affected areas are not well-defined, although they may occur in clusters (Figure 1). Irregularly shaped tan leaf spots may occur on infected leaves. Anthracnose leaf spots appearing on green leaf tissues indicate aggressive disease activity. Typically, infected leaves turn yellow and decay from the tips downward. Foliar blight usually follows normal summer senescence of annual bluegrass.

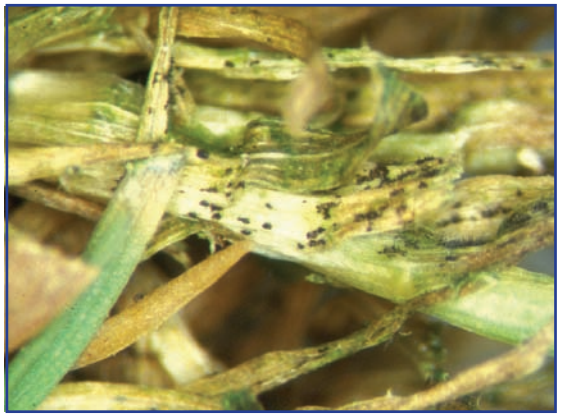

Figure 3

All photos by Richard Latin.

The pathogen also produces spores on infected leaves within specialized structures called acervuli. The acervuli also contain dark, bristle-like features called setae that are diagnostic signs of the disease (Figures 2 and 3). Setae are easily visible with a 10x hand lens.

Basal Rot Anthracnose

Basal rot anthracnose is favored by stresses that are triggered by low mowing, deficient nitrogen levels, or practices that wound plant tissues (such as topdressing and verticutting). The effects of plant growth regulators depend on the amount of stress they place on plants. Recent evidence shows that trinexapac-ethyl (Primo Maxx®) may actually reduce the severity of anthracnose over a single growing season. Basal rot anthracnose appears to be especially severe on putting greens. It seems that annual bluegrass is most vulnerable to basal rot infection during cool, wet spring conditions. Extensive symptom expression and turf damage may not appear until plants suffer summer stress.

Basal infection causes rapid chlorosis and the decline of individual plants. Leaves turn yellow-orange, usually beginning at the leaf tips. Close inspection of affected areas reveals numerous dime-sized spots of symptomatic plants. An infected plant's crown tissues have a dark, necrotic appearance from which the disease takes it name (Figure 4.)

Nonchemical Management Options

Annual bluegrass and creeping bentgrass varieties appear to be equally susceptible to anthracnose infection. It is likely that varieties with improved tolerance to summer stresses will suffer less from anthracnose outbreaks. Avoiding and/or relieving plant stress in the spring and summer will help limit the damage associated with anthracnose.

Spoon feeding small amounts of nitrogen fertilizer (0.1-0.2 lb. N per 1,000 square feet) during the summer will help plants maintain vigor during periods of slow growth. Syringing vulnerable turf during the heat of the day will help relieve heat and drought stress. Also, redirecting traffic may reduce stress associated with wear and tear, and perhaps relieve some of the effects of compaction. On golf greens with significant annual bluegrass populations, practices that promote healthy turf development (such as aeration and topdressing at appropriate times in fall and spring) will help turf tolerate extended periods of summer stress. Finally, raising the cut height will reduce exposure to anthracnose infection and hasten recovery from damage. Some research shows that double-cutting in a single day can achieve desirable green speeds and reduce vulnerability to anthracnose infection.

Control With Fungicides

Anthracnose can be limited by applying effective fungicides at appropriate times. Contact fungicides that inhibit spore germination will limit the extent of severe outbreaks, especially during hot, rainy periods. Contact fungicides that are registered for anthracnose control include chlorothalonil products (Daconil® and others). Some DMI fungicides (Banner Maxx® and Lynx®) have demonstrated excellent anthracnose control. In most studies, polyoxin D (Endorse®) also provided excellent control. The performance of strobilurin fungicides (Heritage®, Compass®, and Insignia®) depends on the sensitivity of the pathogen population. In sensitive populations where there are no apparent resistance issues, expect excellent control. The same applies for benzimidazole products (Cleary 3336® and others). The systemic fungicide fosetyl aluminum (Chipco Signature®) also provides good anthracnose control. Recent research shows that alternating and/or tank-mixing effective chemistries throughout the season will improve fungicide performance.

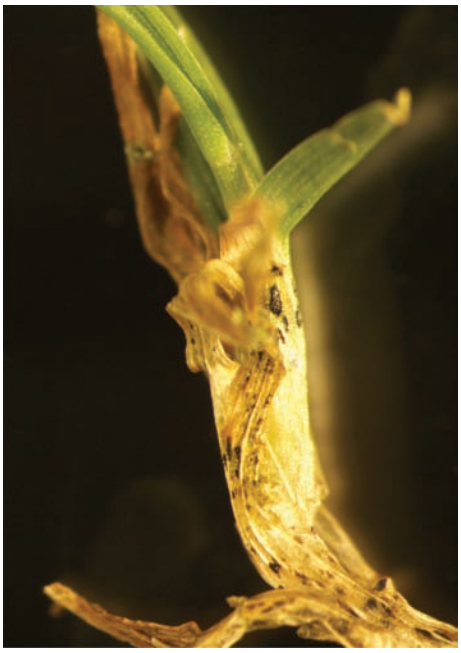

Figure 4

Fungicide application timing is critical for satisfactory disease control, but there appears to be little data from which to draw valid conclusions regarding timing. The best results have been achieved where outbreaks were anticipated and applications were made prior to symptom expression. Although effective fungicides will decrease the progress of foliar blight during the summer, sprays applied during cool, wet spring conditions will suppress early infections and limit the extent of subsequent foliar blight.

Iprodione and vinclozolin fungicides (Chipco 26GT® and Curalan®) are not effective against anthracnose. Flutolanil (Prostar®), although an excellent product for brown patch control, is ineffective against anthracnose.

Recent reports have indicated that anthracnose fungus strains are "resistant" to strobilurin and benzimidazole fungicides. Therefore, turf managers who rely on fungicides for anthracnose control should implement practices that reduce the risk of resistance. Such practices include tank-mixing penetrant products with contact fungicides, avoiding the use of the same or similar fungicides for consecutive applications, and limiting the number of applications of related fungicides during the season. Implementing cultural control options will reduce disease pressure and the risk of evolution towards fungicide-insensitive pathogen populations. Most penetrant fungicide product labels include sections on resistance management strategies.

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