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Plant Pathology Fact Sheet

Turfgrass Anthracnose

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Introduction

Anthracnose is primarily a disease of high maintenance turfgrass, such as annual bluegrass (*Poa annua*) and creeping bentgrass (*Agrostis stolonifera*) at golf courses. In Kentucky it can be a disfiguring disease of creeping bentgrass under putting green management conditions during summertime (June to September). The disease may make its appearance on intensely managed annual bluegrass somewhat earlier (April to September). The anthracnose pathogen can incite a foliar blight phase or the more destructive basal rot phase.

Figure 1. Basal Anthracnose on creeping bentgrass.

Symptoms and Signs

Symptoms of this disease can be variable in appearance. Anthracnose is often implicated in sites where large diffuse areas of turf appear generally unthrifty during midsummer (Figure 1).

Foliar blight

Foliar symptoms occur when leaf blades and sheaths become infected. The older leaves of individual tillers appear to progress quickly from chlorotic to necrotic. Keep in mind that these symptoms can be caused by a variety of stresses, so the disease cannot be diagnosed based on symptoms alone. However, field diagnosis of anthracnose is possible with a hand lens. The pathogen produces tiny, black, pad-like spore structures called acervuli. The distinctive feature of these acervuli is their tiny black spines (setae) that are visible with a hand lens (Figure 2). Acervuli are produced readily on infected leaf blades and sheaths.

Basal rot

Infection of roots and lower stems (crown) results in a basal rot (Figure 3). This phase can produce somewhat different symptoms: discrete patches of yellowish-brown to

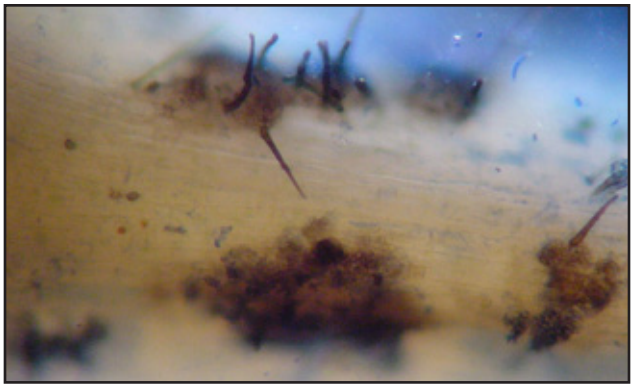

Figure 2. The Anthracnose fungus produces acervuli with tiny spines that are visible with a hand lens.

reddish-brown turf that are one to several feet in size. Crown tissues of individual plants will appear dark and necrotic, especially on *Poa annua*. It is not always clear how basal infections develop; they may begin as infections of leaf sheaths that have progressed into crown tissues. However, root infection by the fungus occurs as well, so crown infections could originate from root infections.

Cause and Disease Development

Anthracnose is caused by the fungus *Colletotrichum cereale* (previously called *Colletotrichum graminicola*). This organism overwinters as dormant fungal structures (microsclerotia) and mycelia in crop debris. Spores produced in acervuli on infected tissues may be spread by splashing rain or mowing equipment.

On creeping bentgrass, this disease is favored by environmental stresses, which probably enhance plant susceptibility to infection. Common stresses associated with anthracnose on creeping bentgrass include high temperatures, dry soil conditions, and low NPK fertility. Although low soil moisture appears to predispose plants to infection, a period of leaf wetness is required for the spores to infect plant tissues. How these variables interact determines whether the disease is most severe in the highest or lowest areas of the green.

On *Poa annua,* basal anthracnose can develop under a wider range of temperatures than in creeping bentgrass. It should also be noted that active anthracnose has been found occasionally on *Poa annua* under snow cover in late winter in Pennsylvania. There are four peak periods of anthracnose development: (1) during cool/moist periods in early spring, and even through winter if conditions are mild and wet; (2) following peak periods of flowering in early summer; (3) during periods of high temperature and humidity; and (4) during periods of extended overcast conditions in late spring.

Basal anthracnose on *P. annua* appears to be favored by slow percolation of soil water, as well as by excessively dry conditions. The combination of excessive soil wetness and heavy traffic can be particularly conducive to disease; therefore, improve drainage and avoid overwatering. A high-organic-matter content in the root zone of a sand-based green can hold excessive moisture and may favor infection.

Figure 3. Basal Anthracnose.

Disease Management

The following disease management practices are suggested for controlling anthracnose on high maintenance turf. For additional advice, including specific fungicide recommendations, refer to the most recent

FIGURE 4. REPEATED TOPDRESSING WITHOUT AERIFICATION CAN IMPEDE DRAINAGE AND INCREASE DISEASE PRESSURE.

edition of *Chemical Control of Turfgrass Diseases* (PPA-1).

Reduce stress

Stress reduction is the first line of defense against anthracnose. This is easier said than done, however, since a putting green mowed at $^{5}/_{32}$" or less with the foot traffic of several hundred golfers on a summer day in Kentucky is obviously under stress. Nevertheless, for both *Poa annua* and creeping bentgrass, cultural practices that reduce stress may help significantly in diminishing the severity of the disease. For additional suggestions refer to the "Reducing Summertime Stress on Putting Greens" section of PPA-1.

- Maintain conditions of moderate fertility using a complete fertilizer. Be sure to provide sufficient soluble nitrogen to maintain a moderate growth rate through the summer.

- Although light topdressing with sand may temporarily increase disease pressure, light, frequent topdressing through the summer has been associated with an overall improvement in anthracnose control in mid- to late summer compared to non-topdressed plots. Repeated topdressing without aerification can lead to layering, which can impede drainage and increase disease pressure from anthracnose (FIGURE 4).

- On greens with the basal rot phase, use walk-behind mowers, and raise the height of cut. Reduce mowing frequency if the green is growing slowly.

- Rolling greens with lightweight rollers (vibratory or sidewinder) three times per week, coupled with regular topdressing, can reduce anthracnose pressure. For best results, a rolling program should be initiated by May 1 to give the turfgrass time to adapt to the treatment before the heat of summer.

- Irrigate greens as needed to avoid drought stress, particularly between midday and late afternoon. Hand-water whenever possible. Avoid irrigation in late afternoon or evening hours.

- The combination of excessive soil wetness and heavy traffic can be particularly conducive to disease; therefore, improve drainage, and avoid overwatering.

- Minimize mowing when the turf is soggy since the equipment will sink into the turf, potentially scalping the turf.

Fungicide applications

Typically, preventative spray programs have been much more effective against anthracnose than curative programs. In addition, fungicide mixtures have provided better results than a single fungicide product used alone. A good guideline is to begin a preventative program approximately one month before the typical onset of symptoms at the site. On creeping bentgrass sites with a history of the disease, begin fungicide applications before Memorial Day, continuing until the end of August. If conditions warrant, it may be necessary to begin fungicide applications by mid-April and continue applications into mid-October. Under severe disease pressure, research shows that biweekly applications may be needed from early April through

mid-November. If temperatures are above normal in December through February, begin a preventative program on *Poa annua* in early to mid-March, especially if conditions in early spring are wet.

Resistant cultivars

If sowing new greens, consider adapted creeping bentgrass cultivars with moderate resistance to anthracnose (refer to the National Turfgrass Evaluation Process Web site) Avoid the most susceptible cultivars, such as Providence, Pennlinks II, Penncross, Seaside II, and Brighton,

Additional Resources

The University of Kentucky publications listed below are available at County Extension offices, as well as on the Internet.

- Chemical Control of Turfgrass Diseases, PPA-1 (University of Kentucky)
http://www.ca.uky.edu/agc/pubs/ppa/ppa1/ppa1.pdf

- National Turfgrass Evaluation Process (NTEP and USDA)
http://www.ntep.org

- Reducing the Risk of Resistance to Fungicides Used to Control Diseases of Turfgrasses, PPFS-O-T-02 (University of Kentucky, 2009)
http://www.ca.uky.edu/agcollege/plantpathology/ext_files/PPFShtml/PPFS-OR-T-2.pdf

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Photos by A.J. Powell (Figure 1), Paul Vincelli (Figures 3 & 4) and Paul Bachi (Figure 2), University of Kentucky

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