

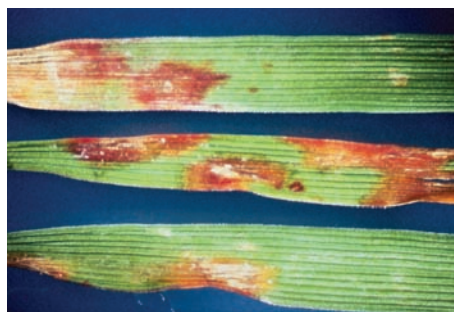


# What's in a Spot?

By **Dr. Jim Kerns** Department of Pathology and **Paul Koch**, Turfgrass Diagnostic Lab Manager, University of Wisconsin - Madison

I probably do not need to remind everyone of the extremely cool spring we experienced, but some interesting samples came through the TDL last week, that are noteworthy. This spring was difficult with respect to timing fungicide and growth regulator applications. The temperatures slowly warmed up, but not enough to really stimulate grass growth. As a result, we saw a lot of diseases of senescent tissue. Diseases that Houston Couch called senectopathic disorders, or diseases that only develop on senescent tissue. Interestingly enough, anthracnose was placed in this category by Couch. I know many of you struggle with anthracnose and probably strongly disagree with Couch's assessment. Yet, there is validity to this placement. *Colletotrichum* species are exceptional saprophytes, which mean they live on dead tissue. If you think about when we see anthracnose, even basal rot anthracnose, it is when *Poa annua* or creeping bentgrass is under severe stress.

Physiological stress can occur under a wide variety of conditions, yet most people tend to think about diseases being most severe under heat stress especially for cool-season turfgrasses. Turfgrass plants are also stressed under low light conditions and in cool, wet conditions. Do these conditions sound like this past spring? Our spring was cool, cloudy and wet; then the temperatures skyrocketed quickly. These conditions were perfect for leaf spots and senectopathic pathogens were observed in samples submitted to the TDL. The most common problems we saw were red leaf spot, bipolaris leaf spot and foliar anthracnose.



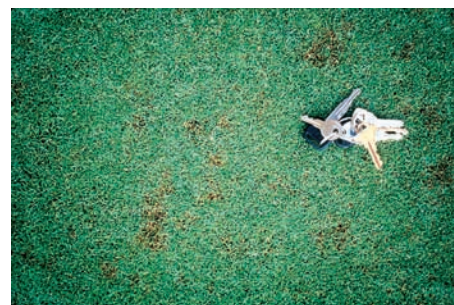
**Figure 1. Plant symptoms of red leaf spot of creeping bentgrass caused by *Drechslera erythrosipila*. (Courtesy of APS Press).**

## Red Leaf Spot:

Red leaf spot is a disease of *Agrostis* species and is caused by *Drechslera erythrosipila*. Symptoms are small reddish-brown to brown circular or oval spots (Figure 1). The inner portion of the spot may or may not be straw-colored or tan. Stand symptoms appear as irregular shaped patches that are randomly distributed. Typically the affected turf has a reddish-brown color (Figure 2). As the affected area progressively gets worse, the patch may have a blue cast and may resemble drought stress.

Red leaf spot is described as a warm, wet weather disease of *Agrostis* species, but many of my turfgrass pathology colleagues, including myself, typically see this disease in cooler, wet weather. The fundamental problem with the description of red leaf spot is the lack of specific conditions conducive for disease development. The words "warm" and "cool" are all relative. In South Carolina, cool is considered 75°F, whereas we consider 65°F and above warm. We typically see red leaf spot in mid to late spring when daytime temperatures are above 60°F.

The best recipe to control red



**Figure 2. Stand symptoms of red leaf spot on a creeping bentgrass putting green (Courtesy of APS Press).**

leaf spot is good growing conditions, which is easy for me to say sitting in my ivory tower. Sometimes patience is a virtue in leaf spot control, however if conditions are favorable for an extended period of time red leaf spot can cause enough damage to warrant a fungicide application. If a fungicide application is required, a tank mixture of iprodione and chlorothalonil usually does the trick.

## Bipolaris leaf spot:

Most diseases incited by *Bipolaris* species occur on warm-season grasses, except for *Bipolaris sorokiniana*. This particular fungus has a huge host range and has been very damaging to mature creeping bentgrass stands throughout the Upper Midwest. The fungus causes diseases of foliar, crown and root tissue, which upon expression can look very similar to those of red leaf spot (Figure 3).

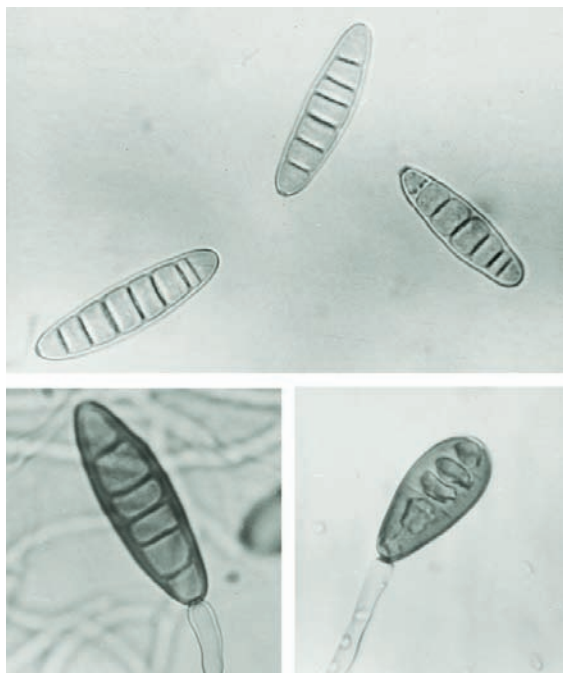
This particular disease has been most problematic on older fairways where the original species has segregated. Usually the fungus only attacks one or two of the segregates at a time. We do not have data to support this; this has been our observation in the field. The question that remains is how do we



**Figure 3. Bipolaris leaf spot of a creeping bentgrass fairway in Wisconsin caused by *Bipolaris sorokiniana*. Although these symptoms are more severe in this picture, the symptoms do resemble red leaf spot initially.**

**Figure 4. Spores of *Bipolaris* species. The top is *Bipolaris cynodontis*, which infects warm-season grasses, and the bottom pictures are *Bipolaris sorokiniana*. The key with identification at the spore level is the shape and size**

(Courtesy of APS Press).



distinguish between red leaf spot and bipolaris leaf spot? A microscope is needed to observe sporulation of the causal fungi. *Bipolaris* fungi are prolific spore producers and make a spore that is tapered and usually smaller than the red leaf spot pathogen (Figure 4). Species of *Drechslera* do not sporulate as readily as *Bipolaris* species. You are probably thinking, who the hell cares, we can control both diseases with chlorothalonil! This may not be true. Although we do not have the data to support the following statement, it appears that

products that contain a QoI (azoxystrobin, pyraclostrobin, trifloxystrobin, fluoxastrobin, etc.) seem to provide the best suppression of bipolaris leaf spot. We do not know if a QoI will work on its own, but we are planning on conducting laboratory sensitivity assays to determine the sensitivity of *Bipolaris sorokiniana* to the various QoI's.

#### **Foliar Anthracnose:**

Foliar anthracnose can be a severe issue in stands where *Poa annua* is the dominant turfgrass species. However, Couch makes an excellent point when he placed

anthracnose into the class of senec-topathic disorders. Remember that anthracnose is usually only a severe problem when turfgrass plants are subjected to extreme heat and drought stress. Why? Older tissue is naturally being phased out during these stressful conditions, so *Colletotrichum* just facilitates the death of the senescent tissue. Please do not misunderstand me though, without the pathogen the death would not be as rapid nor would it develop into the symptoms we observe.

As mentioned earlier, *Colletotrichum* species are formidable saprophytes and commonly inhabit turfgrass plants without inducing anthracnose symptoms. These fungi are commonly observed on all parts of a turfgrass plant on samples submitted to the TDL. A word of caution for those with microscopes, you can find *Colletotrichum* in almost every sample you look at. The key is knowing when the natural population has gotten large enough to

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**Figure 5. Acervuli of *Colletotrichum cereale*, the causal agent of turfgrass anthracnose. Note the number of acervuli present on the foliage of this plant. These structures are readily found on almost every sample that comes through the TDL.**

overwhelm the plant. Basically we need to see an abundance of acervuli, the appropriate environmental conditions and plant and stand symptoms typical of anthracnose before we diagnose anthracnose as a problem (Figure 5).

On creeping bentgrass, *Colletotrichum* is usually only a severe problem in very hot climates, like the Southeastern United States. However, the fungus can cause a foliar blight under low light, cool, wet conditions. Sound

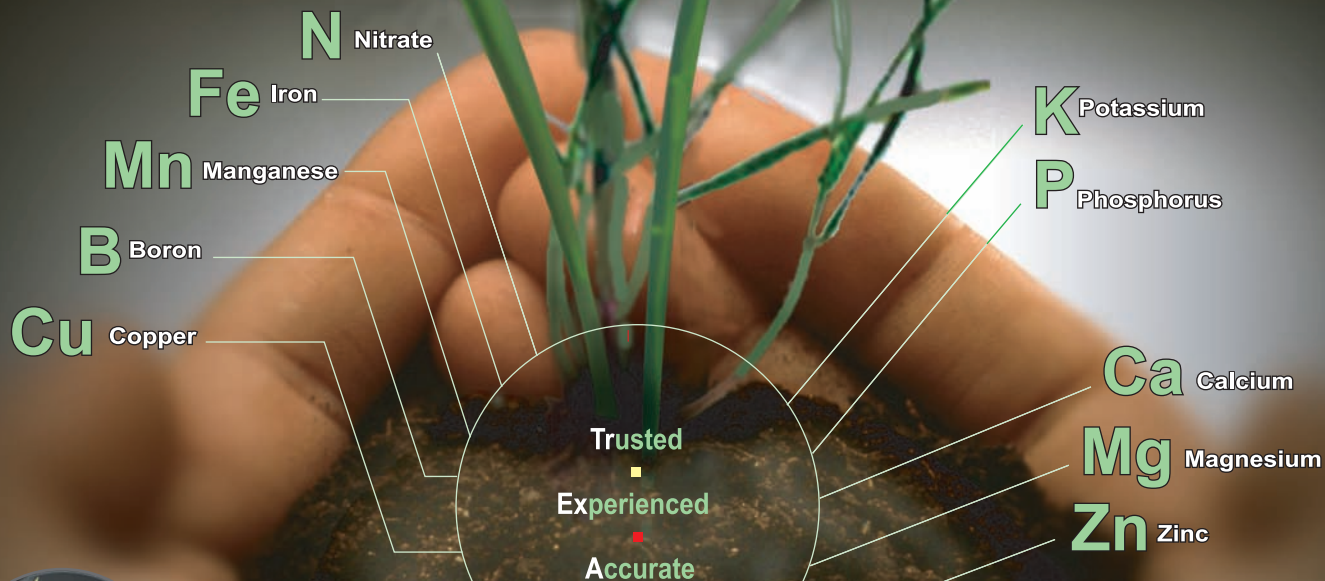
similar to red leaf spot?? Stand symptoms of foliar anthracnose of creeping bentgrass are very similar to stand symptoms of red leaf spot. Usually foliar anthracnose will not produce a reddish brown spot on the foliage. Fortunately it is not important to definitively distinguish between foliar anthracnose and red leaf spot of creeping bentgrass because the control recommendations are the same. Applications of chlorothalonil or a tank mixture of iprodione and

chlorothalonil will suppress both foliar anthracnose and red leaf spot of creeping bentgrass. I hate to repeat myself, but good growing conditions will also remedy these two diseases. That is of course, if you have the luxury of patience at your facility.

These foliar diseases can be problematic and were fairly severe this year. Fortunately they are relatively easy to control. The best procedure for controlling these three diseases is to submit a sample to the TDL to ensure the symptoms you observe are actually a disease. If it is a disease we can give you an idea of how bad the disease is and make a recommendation based on what we have observed. Hopefully this article has given you a new appreciation of leaf spots!



## Elements of Successful Turf Management



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