Heat and Humidity Wreaking Havoc on Cool-Season Grasses

The Plant Disease and Insect Diagnostic Laboratory at Oklahoma State University has been flooded with cool-season grass samples over the last several weeks. Most of these samples are from creeping bentgrass greens from around the state. Most of the submitted samples are suffering from summer-heat related stress and are in general decline. Cool-season grasses, especially fescue and creeping bentgrass grow best during the cooler seasons. When ambient air temperatures become hot (90 F+), growth of these grasses will dramatically slow or stop and can go into rapid decline. Root growth of cool-season grasses will cease when soil temperatures are above 80 F. Currently, the 4-inch, under-sod soil temperatures for much of the state are in the upper 70s to low 80s. Thus, root growth on cool-season grasses is probably not occurring. Research has also shown that as air and soil temperatures rise above 90 F roots will start to die. The sustained weather conditions over the last several weeks have been extremely detrimental to cool-season grass health. Expect that cool-season grasses may be experiencing periods of no root growth, root decline, or death. For some areas the situation has been made worse due to poor root growth that occurred during the spring. Plants that entered summer without a sufficient root system are more likely to not sustain growth, turn yellow or brown and go into general decline. Symptoms of decline can resemble diseases caused by pathogens. Patch symptoms due to summer stress may look much like take-all patch or Microdochium patch. Turf can appear off color or golden brown and in areas where the plant stand is thin algae formation is common (see picture). When roots are examined no evidence of the pathogens that cause these patch diseases are typically present. While evidence of root inhabiting fungi will often be noted, many of these fungi are simply naturally occurring root-inhabiting organisms that are not typically pathogenic. However, once root growth stops and turf becomes stressed these organisms can also contribute to root mortality. Also beware that while it may appear to the naked eye that the grass plant has deep or healthy roots this may not be the case. The vascular portion of the root is resistant to decay and may appear to be healthy when in fact it is dead.

If it is suspected that a cool-season grass is experiencing summer decline, water and fertility management are going to be critical. Where appropriate, water very deeply and infrequently and try to avoid early evening irrigation. Nitrogen fertilizer applications should be minimal and “spoon feeding” may be necessary to sustain the turf until temperatures are more favorable for cool-season grasses. Avoid damaging activities such as dethatching, aerifying, and any other management technique that can cause injury to the turfgrass until it is again actively growing.

Weather conditions in general have been too hot and dry for most typical turf pathogens. Remember, fungal pathogens require lots of moisture or very high humidity and moderate temperatures to infect and cause disease. With that said folks should be on the lookout for brown patch and Pythium foliar blight on cool-season grasses should the weather turn humid and wet. Lately, prevailing conditions have been too dry in most of the state for widespread epidemics of these diseases. However, if supplemental irrigation is available or you are in an area that has been fortunate enough to receive rain in the last few days, these diseases may be of concern.

Currently weather conditions are too hot and dry for Pythium foliar blight, caused by various species of *Pythium*. However, if sufficient moisture becomes available, average
temperatures recede back into the high 80s – low 90s, and cloudy conditions prevail, then Pythium foliar blight could be of concern. Foliar blight will include water-soaked leaf lesions and plants will begin to die and form large patches of sunken brown areas. Leaf lesions will not have a surrounding border unlike brown patch leaf symptoms. If humid conditions persist, thick tufts of white, cottony mycelium (body of the fungus) will erupt from leaf tissue. Management recommendations for Pythium foliar include improving drainage, reducing foliar wetness, and encouraging air movement. Fungicides should be used preventatively and sparingly for this disease, as the pathogen can readily develop resistance to repeated use of the same fungicide. Commercial fungicides for Pythium foliar blight control include Heritage (azoxystrobin), Segway (cyazofamid), Subdue (mefonoxam), Banol (propamocarb), and others. Again, be sure to consult the label for all restrictions and use recommendations.

For more information on heat stress and “summer decline” in cool-season grasses, check out the Turfgrass Disease Blog (http://turfdiseases.blogspot.com). There is some great information from other pathologist throughout the country, plus a statement from Clark Throssell and the GCSAA.

Summer-heat related stress and decline on a creeping bentgrass putting green. Note the black algal “film” in areas where the plants are in low density.