Kansas City giving to St. Louis? It must not be good. All of the late May/early June precipitation dousing the western part of MO was graciously donated to the east during the middle and later parts of the month. The St. Louis area has received anywhere from 3-8” above normal precipitation in the last 14 days, which mirrors exactly what KC experienced. Above average temperatures have also graced the region along with the rainfall, and it’s not the high highs that have been the issue, but instead the high lows (see above). Over the last 7 days, the high temperatures have actually been either average or below, but the low temperatures have ranged 3-7 degrees above normal (http://climate.missouri.edu/mcw/). Warm, sticky nights with frequent rainfall = disease, and the earlier problems in the urban west have shifted swiftly over to the urban east.

The forecast over the next 6-10 days shows a welcome cool down for later this week through the beginning of July (see below – blue is good). Lower 80 degree highs and mid 60 lows will encourage continued growth of cool season turfgrasses, but won’t necessarily curtail the large wave of disease activity. Along with the cool down, however, we are also forecasted for frequent rains again, which means soggy conditions for the east will continue and make scheduling maintenance practices tough again.
Quick Hits:

- **The Many Problems of Saturated Soils** – Late last week, Dr. Dave Trinklein penned a great article describing the many agronomic pitfalls of an oversaturated soil ([http://ipm.missouri.edu/MEG/2015/6/Wet-Weather-Woes](http://ipm.missouri.edu/MEG/2015/6/Wet-Weather-Woes)). All of the issues he outlines can be echoed for turfgrasses, (oxygen-starved roots, in particular), and could have repercussions if a typical Missouri summer does manifest. Some cases of wet wilt on tomato have been reported, a condition where saturated or previously compromised roots cannot keep up with the transpiration needs of the plant. This same condition also may occur on golf putting greens on hot, windy days. A cool summer may make this point moot, but being vigilant in venting putting greens before or after rainfall events may reduce headaches when July and August roll around.
- To say this is already an epic **brown patch** year in Missouri is not an understatement. Homeowners from all over the state have inquired how to stop this beast, and various news outlets are reporting on the epidemic. Conditions have been so ripe that mycelium of the brown patch pathogen (*Rhizoctonia solani*) is fluffing out from infected leaf blades similar to dollar spot and Pythium. Shaded areas are much more susceptible to brown patch, but since cloud cover (the ultimate umbrella) has been prominent over the last few weeks even non-shaded areas are contracting the disease. Although *R. solani* doesn't fruit and produce true spores on turfgrass like *Colletotrichum cereale* (anthracnose) or other pathogens, it can produce chlamydospores, which are single cells of hyphae that break off and can be spread through water or mower traffic (see above). For curative management, try to get areas to dry out, and don't compact saturated areas with equipment. With the high rate of growth and frequent rains, mowing should be conducted as frequently as possible to keep the canopy open (reducing humidity & leaf wetness). Mow tall fescue at 3.5 – 4” to reduce the amount of clippings that may be deposited on the canopy, retain competitive advantage over weeds, and maintain plant health. Clippings left on the turf surface construct a humidity chamber for brown patch development, so it's critical to either remove or disperse them after mowing. Note shady areas and consider pruning trees to allow drying of morning dew through sunlight.
and increased air flow (http://extension.missouri.edu/p/G6866). The most effective fungicides are flutolanil and the strobilurin class, which are unavailable to homeowners in major retail outlets.

- One would think large patch would be a non-issue by now, but the weather just won’t let me stop talking about it. Large patch is still firing at the MU research farm, and the 8-10” of rain over the last 7 days in St. Louis has led to new infections there as well. At this point, fertilization, if it hasn’t occurred already, will need to be applied on zoysiagrass, even if during an active infection period. Unfortunately, wet and cool temperatures may continue the infection period for another week. Simply put, not a good season for warm season turfgrasses.

![Image of precipitation and dollar spot]

Dollar Spot on Warm Season & Nitrogen Loss
A. Dollar spot has been especially severe on warm season turfgrasses this season. Nitrogen applications will help warm season turf recover.
B. Nitrogen loss from well drained soils as estimated by precipitation. Diagonal lines are considered “danger areas” whereas cross-hatched areas are considered problem areas.

- Speaking of the need for nitrogen, dollar spot is continuing to wreak havoc on cool season grasses such as Kentucky bluegrass and bentgrass. The disease is also causing considerable issues on warm season turfgrass, in particular zoysiagrass. This rare occurrence may stem from the severe nitrogen loss that is occurring throughout the lower Midwest from the excessive rainfall (click here for Nitrogen Watch website). Dollar spot is a low nitrogen disease, and starved zoysiagrass is more predisposed to damage. Particularly on zoysia home lawns and fairways, nitrogen applications (0.5 – 1 lb N/1000 sq ft) should already have been made. Most zoysiagrass will not require a fungicide for dollar spot control and will grow out of the disease with fertilization. As with all dollar spot outbreaks, a small
shot of nitrogen along with a curative fungicide will enhance recovery. The current nitrogen shortage should also put golf superintendents on notice for potential anthracnose development on susceptible bentgrass cultivars or managed *Poa annua*. For tall fescue management, the presumptive nitrogen loss shouldn’t prompt the spinning of a fertilizer spreader, as additional nitrogen will throw grease onto the brown patch dumpster fire.

**Pythium Root Diseases on Creeping Bentgrass**
Maxwell Gilley, PhD student

The recent high amounts of precipitation and increased temperatures have caused an influx of samples containing Pythium root diseases submitted to the MU Plant Diagnostic Clinic. The forecast doesn’t seem to be letting up in the near future, so the MU Turf Pathology team wanted to write a brief article reminding turf managers what to scout for and if you do find or suspect Pythium root diseases, get ahold of us!

Pythium root rot (PRR) occurs in over-saturated conditions or areas with poor drainage. Disease outbreaks can occur following high rainfall events accompanied by high temperature stress. Symptoms of turf infected with PRR initially look wilted, and then progress into yellow or dark-colored areas occurring in irregular, mosaic-like patterns occasionally following drainage patterns (Fig. 1). Individual plants may have rotten crowns and roots. Several *Pythium* spp. have been associated with PRR throughout the country. Pythium root dysfunction (PRD) is a disease that was recently described in North Carolina on young (<5-7 years) bentgrass putting greens. While we have not observed PRD or isolated the causal organism from submitted samples, it is a disease we are on the look out for. Symptoms of PRD include plants that are initially wilted and chlorotic then develop a yellow-to-orange foliar decline. Infected roots will simply be tan or buff and lack root hairs, one of the distinguishing characters between PRD and PRR. Unlike PRR, symptoms of PRD are most severe during periods of hot and/or dry weather and develop on exposed, dry areas of turf as opposed to low-lying areas most commonly associated with PRR. More information on PRR/PRD can be found in a previous disease update (6/26/2011 update) and Disease Profile (PRR Disease Profile).
The *Pythium* project was developed to determine the distribution of *Pythium* spp. causing root diseases in the Midwest. Over the 2014 growing season, 14 samples from IL, KS, and MO were received with suspected *Pythium* root disease. Thirty-seven isolates were tentatively identified as *Pythium* spp. from these samples. These isolates will be molecularly identified then screened in greenhouse virulence assays to evaluate isolate aggressiveness. Additional greenhouse experiments will involve varying soil hydrology (VWC) to pinpoint when greens are most at risk for disease development. Isolates found to be most aggressive will be used in 2015 field studies incorporating the use of 27-inch diameter PVC “rhizosphere microplots” allowing the inoculation and containment of a single *Pythium* isolate.

Sampling and collection of isolates is imperative to the success of this project. We want to get the best idea of what *Pythium* spp. and diseases are occurring in our region. Submitting a sample is easy and can be important if you perhaps don't have *Pythium* root disease- follow this link [Diagnostic Clinic Sample Submission](#), fill out the Turfgrass Disease Identification Form as best as you can (fungicide history REALLY helps), then overnight the sample. If you suspect you may currently have a *Pythium* root disease, or have had problems in the past, please contact Max Gilley at [mdgfg8@missouri.edu](mailto:mdgfg8@missouri.edu) to setup a site visit or sample submission.

**Mizzou Field Day & Lobenstein Golf Tournament – July 21, 2015**

The schedule is set (see below) so make plans to attend the 2015 Mizzou Turfgrass and Ornamental Field Day to be held at the MU Turfgrass Research Farm in Columbia, MO. The morning will be packed of education on topics ranging from turfgrass pest control to NTEP cultivar trials to ornamental flower selection to soil testing analysis. In the afternoon, we will be having our first annual Lobenstein Scholarship Tournament. This 9-hole event will be held at Columbia Country Club and all proceeds will benefit the Lobenstein Fund. The fund awards two $1,000 scholarships annually to deserving MU undergraduate students in Landscape Design, Horticulture, or Turfgrass Science, and is the legacy of Dr. Bill Lobenstein, who founded the MU turfgrass program and was instrumental in its development. The
Of Mycelium & Men

forecast for the day is certain to be cool, so plan on a day full of education and camaraderie on July 21.

Attendee Registration can be found at http://motoc.org/fd/reg.cfm.

Exhibitor registration can be found at http://motoc.org/fd/exhibit.cfm.

Lee Miller
Follow on Twitter! @muturfpath
Like on Facebook! Mizzou Turfgrass
Extension Turfgrass Pathologist
University of Missouri

2015 Turfgrass & Ornamental Field Day
July 21st, 2015: Schedule of Events

7:30 – 8:30 a.m. Registration, coffee/donuts and exhibitors

8:30 – 9:00 a.m.
Welcome & Introduction: Dr. Lee Miller, Turfgrass Pathology
Welcome & Program Update: Dr. Jim English, Director of Division of Plant Sciences,
Welcome & MOTOC Update: Gabe Huffington, MOTOC President

9:00 – 10:20 a.m. Morning Session I: Visit 4 of 5 topics
Presentations last 10 minutes; 10 minute Q&A/Transit time

STOP 1 Billbug Control on Zoysiagrass Turf
Michael Patterson - M.S. Program, Dr. Bruce Barrett – Professor: Entomology &
Dr. Xi Xiong – Assistant Professor: Turfgrass Science

STOP 2 Dealing with Problem Patches on Warm & Cool Season Grasses
Dr. Lee Miller – Assistant Professor: Turfgrass Pathology

STOP 3 New Tools for Disease Control on Golf Putting Greens
Daniel Earlywine, M.S. – Turfgrass Pathology

STOP 4 Ornamental Diseases: Sample types, diagnoses and common pathogens
Patricia Hossack, M.S. – MU Plant Diagnostic Clinic Director

STOP 5 Soil, Plant, and Nematode Diagnostic Services Available at the University of Missouri
for the Turfgrass, Lawn Care, and Landscape Industries
Dr. Mandal Nathan – Associate Professor: Nutrient Management &
Amanda Newland – Director of MU Plant Pathology Laboratory

10:20 – 11:40 a.m. Morning Session II: Visit 4 of 5 topics
Presentations last 10 minutes; 10 minute Q&A/Transit time

STOP 6 Don’t Forget to Calibrate That Sprayer…
Dr. Brad Freesburg, Assistant Professor: Turfgrass Science

STOP 7 What’s New with Emerald Ash Borer?
Collin Wamsley - State Entomologist: Missouri Department of Agriculture

STOP 8 Evaluation of Annual Flower Selections for 2013
Dr. David Trumble – Associate Professor: Horticulture

STOP 9 Why Be Concerned About Insect Pollinators?
Dr. Richard Houseman – Associate Professor: Entomology &
Dr. Bruce Barrett – Professor: Entomology

STOP 10 Using Ryzex® for control of Myzus persicae in tall fescue turf
Steve Song, Ph.D. student & Dr. Xi Xiong – Assistant Professor: Turfgrass Science

11:40 – 12:00 p.m. Exhibitor Demonstrations

12:00 – 12:45 p.m. Lunch, Exhibitors

1:30 p.m. Tee Off
Lobenstein Scholarship Tournament
Columbia Country Club
2210 Country Club Dr.
Columbia, MO 65201