July was brutal on both turfgrass and sweat glands throughout the region. Until this recent cool down, temperatures were running 2-3 degrees above normal with frequently high 70+ % relative humidity. High ET rates (~0.2” per day in some locations), and extraordinarily high 2” soil temperatures (+90 F averages) followed suit. Predisposing heat stress on cool-season turfgrasses opened the door for many diseases, and assisted a ton of green grass through the door to the house of brown. Fortunately, cooler temperatures are expected to stay with us through this last day of July and into the first portion of August. Lower nighttime temperatures translating into lower soil temperatures can help temper a lot of ills, and I expect (and hope) for quite a bit of recovery over the next week.

Frequent rainfall events, particularly in the urban centers of STL and KC, have fanned the flames. Both areas should be at least 2-3 inches above normal rainfall for the month, an anomaly for July which is normally one of our driest months. The rain, falling now, is forecasted to continue, with Missouri in the crosshairs of potentially 3+ inches of rainfall total through the weekend and into Monday.
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Quick Hits

- **Cooler Temperatures** – All good right? If you make it so. On greens, anthracnose can flare quickly when plants want nitrogen but don’t have it. Make sure to bump up your spoon-feeding nitrogen rates slightly to match growth potential, which should rise with the falling temperatures. On lawns, consider a rare tickle of nitrogen in early August with a light 0.25 lb N/1000 sq ft rate to keep growth going.

- **Gray Leaf Spot Warning** – Reports are starting to flow in from the SE and other parts of the country regarding gray leaf spot outbreaks. Begin to monitor for this disease on tall fescue lawns, and realize that lawns on a preventive azoxystrobin program for brown patch may not be protected. Leaf symptoms are slightly different from brown patch, as illustrated well in [this post from Lee Butler at North Carolina State University](https://www.louisIANA.com). New seedlings are especially vulnerable, and in high amenity areas or those with a severe history adding thiophanate-methyl (which is not very effective on brown patch alone) should be considered.
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- **Billbug Warning** - On the zoysia front, we are finding some larvae and suspicious areas of zoysiagrass decline that could be attributed to billbug activity. A fantastic publication authored by Doug Richmond at Purdue University can be reviewed here - https://extension.entm.purdue.edu/publications/E-266/E-266.html.

- **Summer Patch on Creeping Bentgrass & Poa annua Greens** – In the last update, I noted issues with summer patch on Kentucky bluegrass, and turns out the pathogen was also busy at work on putting greens. Three putting green samples came into the lab in the past week with severe summer patch infections along the stolons/roots of bentgrass and Poa annua (which luckily for most doesn't have stolons). Recovery from any soilborne disease will be slow, but a watered-in application of one of the “cool” DMIs tankmixed with a QoI in the form of Briskway and Navicon should start roots on the path to recovery. The reason these are termed “cool” is that we’ve sprayed them at 2-3 times the effective rate on a 14-day interval in the summer heat and have not witnessed the phytotoxic or growth regulating effects associated with previous DMIs. Remember to water these in thoroughly, as noted in the previous report. A small bump in fertilization with an ammonium sulfate source may also help (0.2 lb N/1000 sq ft), but take care that black layer is not present in the soil profile as AMS can exacerbate it. Last but not least, venting the greens now with solid (bayonet, pencil, etc) will aid in root health, particularly after all this.
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rain. Research shows, however, that core aerification really does the trick in reducing summer patch severity.

Pythium Root Rot on Bentgrass Putting Green
A. Rinsing roots shows the infection. White roots - Left; Pythium-infected roots - Right.
B. Pythium infected root on top, non-infected on bottom.

- **Pythium Root Rot on Putting Greens** – As usual, the number one disease arriving in the lab over the past two weeks has been Pythium root rot. Golf superintendents should continue to be en garde against this disease despite the cooler temperatures. The temperatures and hopeful recovery may lull some into a false sense of security. Remember, this pathogen only needs a pool to swim in, and has gotten, and will be getting, plenty of chances to execute its backstroke on putting green roots. Cyazofamid applications should be the backbone of prevention with other chemistries such as propamocarb, mefenoxam, the QoIs, fosetyl-Al, and the phosphites alternated in a management program. Remember to water these in.
• **Pythium blight on Tall Fescue (Moderate) & Kentucky Bluegrass (Severe)** – Pythium isn’t just for roots or short grass in July, as significant outbreaks have been observed on Kentucky bluegrass and Kentucky bluegrass + tall fescue mixtures at lawn height. In mixed stands, the blight normally crushes the bluegrass, but also can cause quite a bit of damage on the tall fescue. Both of these species can also be burdened with brown patch at the same time (as noted below), which is a devastating double whammy. Azoxystrobin-based brown patch programs do provide some prevention for Pythium, but in some of these cases a stronger Pythium specific fungicide such as mefenoxam or propamocarb may need to be supplemented. A long term, sustainable solution is to fix drainage issues, and/or not continue irrigating when Mother Nature is providing plenty!
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Smoke with the Water

Like the famous song by Deep Purple, there’s been a ton of smoke on the turfgrass this July. Rhizoctonia diseases have flared considerably in the last two weeks on creeping bentgrass, tall fescue, and even Kentucky bluegrass. Kentucky bluegrass has been incorrectly assumed to be immune to this disease, but this is the third straight summer we have observed severe, conspicuous brown patch on our ‘HGT’ bluegrass block, and on a few other cultivars.

On Kentucky bluegrass, disease diagnosis may now be complicated, and there are potentially new things still to be learned about this pathogen attacking an unsuspected host. Patch or ring symptoms normally reserved solely for summer patch or necrotic ring spot, may in fact be brown patch. It’s also unclear if this is the same pathogen for both tall fescue and Kentucky bluegrass, which would be important in mixed species stands frequently used on lawns since disease symptoms may progress normally through the sward (which would be unfortunate).

_Difference between brown patch on KBG and summer patch/NRS:_
As for the potential confusion with summer patch and brown patch, examine the patch margins early in the morning during a dew set for tufts of white
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mycelium on the foliage (aka the smoke ring). Summer patch and NRS pathogens, being soilborne, will not produce this aerial mycelium, and should only result in blackened necrotic roots and rhizomes.

*Difference between brown patch on KBG and other foliar diseases:*  
In the below photos, foliar symptoms of brown patch and dollar spot on Kentucky bluegrass are shown. Luckily for these two diseases, the stand symptoms of a 4-6” diameter round spot for dollar spot and the more patch-like symptoms of brown patch should be a good indicator. However, the foliar symptoms may also stand out with brown patch having scalloped, irregular shaped tan lesions with a dark brown margin, and dollar spot with a pronounced white colored lesion. In our observations, both diseases can form the hour-glassed shaped lesions famously reserved solely for dollar spot, so put a critical eye to several of the leaf blades prior to coming to a conclusion based on foliar symptoms alone. It’s also important to examine the leaves for potential Pythium infection, which will be water-soaked, slimy and can smell of wet shoes.

**Kentucky Bluegrass - Some Cultivars Get Brown Patch**

A. Brown patch lesions on Kentucky bluegrass  
B. Two KBG cultivars next to each other. Left - Brown Patch; Right - Dollar Spot  
C. Typical dollar spot lesion on Kentucky bluegrass.

*Cultivar Differences:*
At the MU Turfgrass Research Center, we have observed brown patch infections on two of our Kentucky bluegrass varieties thus far, ‘HGT’ and ‘Tirem’. ‘Tirem’ is shown in photo B above, on the left (and as luck would have it the cultivar ‘Right’ with some dollar spot is on the right). We have heard reports of other Kentucky bluegrass cultivars getting brown patch symptoms in the area, but more investigation is needed. Interestingly, in the previous
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NTEP Kentucky bluegrass cultivar evaluation, ‘Barvette HGT’ was reported as least susceptible of the entries. A notable difference is that our ‘HGT’ block is the commercially available mixture of several different cultivars. [NTEP report can be found here.](#)

*Control:* Kentucky bluegrass recovery from brown patch, like with tall fescue, is often fairly quick when optimal growing temperatures resume and conducive environmental conditions die down. The infections do, however, open the door for bermudagrass and other weeds, and in some cases may require intervention with fungicides. In our early trials, the QoIs tend to control the disease similarly to that in tall fescue.