

Bacterial etiolation in Nebraska, a definitive maybe...**October 4, 2018**

Growing turf in 2018 has been challenging, to say the least. This was true not only in Nebraska but throughout the cool season regions of the US and Canada. The onset of cooler and shorter days is often a prelude to less stress, including disease. Not so in 2018, while turf is often infected with numerous leaf spot pathogens rarely do we see the level of damage described in last week's Turf iNfo

<https://turf.unl.edu/turfinfo/9-21-GLS-and-Melting-Out.pdf> . A

Saturday morning text from Dan Riner at Wellington Greens presented a challenge that, we suspect, was related to hostile growing conditions that continue to persist. While initially we set up a visit for Monday to look at something going on with his greens, I figured with the rainy and gloomy weather (possibly an omen for the NU/Purdue game later that day?), why not stop by. Now, a week later, we still don't have a conclusive answer but it does make for an interesting story, at least to a turf nerd.

The first two greens Dan showed me are relatively open and receive plenty of light and dry out relatively well, even with the amount of precipitation they had recently received. They had some yellowing and discoloration that was noticeable, but did not appear extensive. We talked about the recent wet weather and the string of 90 degree days that had occurred the previous week. Certainly a precursor for

numerous fungal pathogens. Appropriate fungicides had been applied, typical for greens height turf. We then, and this is where it gets interesting, looked at greens that do not dry out readily, airflow is limited and shade is extensive. The affliction was much more pronounced and individual bentgrass leaves were taller (AKA-etiolated) than the surrounding bent grass and yellow. The annual bluegrass was unaffected.



Figure 2. USGA image of bentgrass etiolation.



Figure 1. Afflicted green in Lincoln, NE.

We have included an image provided by the USGA given the rain did not allow a good image capture. The USGA image is a mirror image of what we were seeing. It reminded me of conversations/publications starting in 2011 about bacterial wilt of bentgrass. The newness of this pathogen has made it a relatively hot topic with reports across the US. Pathologists have not come to a consensus on a name, calling it bacterial etiolation, bacterial wilt and bentgrass decline. It

is most often associated with the bacterial species *Acidovorax*. This species has not, however, been definitively identified as the only causal agent. Although little is known about the etiology and control of etiolation and bacterial decline of turf, it appears to be stress related. Symptoms are often associated with changing weather conditions and are more widespread with frequent rainfall, high temperature and high humidity. Given most, if not all, of these conditions were applicable to the afflicted greens the logical next step was confirmation. We brought a sample to the lab and looked at it under a compound microscope. If the affected leaves were clipped and placed in water on a slide we would be able to observe bacteria streaming from the cut end of the leaf. Keenan Amundsen, our turfgrass geneticist and I did this in the turf lab and were relatively confident we confirmed it as bacterial etiolation/decline. Relatively confident are the operative words here. Neither Keenan nor I are pathologists. I shared a sample with Kyle Broderick in the UNL diagnostic lab and together we repeated the process with better equipment and no streaming was evident. It was definitely not fungal and we were unable to see any signs of a bacterial infection. All the symptomology but without diagnostic confirmation. Subsequently I have had a conversation with Larry Stowell of Pace Turf who has frequently diagnosed bacterial etiolation. He indicated that the streaming is not always prolific and more evident at the base of the leaf vs. the upper leaf segments. As the title of this Turf iNfo suggested “*Bacterial etiolation in Nebraska, a definitive maybe*”. If any superintendents have documented this pathogen on their course in Nebraska, please let us know.

Until more research is conducted on this emerging problem, the best course of action is to reduce plant stress and avoid practices that cause excessive wounding of turf, particularly during periods of environmental stress. Bruce Clark at Rutgers University provides possible short-term strategies if bacterial decline is suspected or confirmed:

- raising the height of cut, switching from heavy to light weight mowers, reducing rolling (not mowing) frequency, and using solid rollers on mowers
- hand syringing to avoid soil moisture extremes (particularly drought stress)
- avoiding the use of ammoniacal fertilizers (e.g., ammonium sulfate) in favor of nitrate-based sources during symptom expression
- avoiding heavy topdressing applications during hot weather (> 90°F) and dispersing bunker sand on greens each day (e.g., with a back pack blower prior to mowing)
- delaying aerification, spiking, or other cultivation practices until the problem subsides
- reducing shade
- improving air circulation around greens to reduce the leaf wetness period.

I suggest readers seek more about this affliction before reacting to symptomology. Qualified research is being conducted across the US and given the newness of the research, conflicting information is still problematic.

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