

Project Title: Heat Tolerance in Creeping Bentgrass for Future Development of Cultivars
Adapted to the Southeastern U.S.

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Introduction:

Creeping bentgrass is a highly valued turfgrass species for fine-turf areas due to its dense canopy and ability to withstand low-mowing heights. However, it is susceptible to heat stress, notably during Georgia summers which are characterized by high humidity and high night time temperatures, ultimately leading to declines in plant health. Plant decline due to heat stress is a multifaceted problem, due to heat stress affecting protein metabolism, photosynthesis and carbohydrate reserves, as well as inducing damage to cellular components. The development and implementation of elite germplasms is one of the most important strategies in order to improve summer performance in cool-season turfgrass species. Previous research at the University of Georgia has identified breeding lines that may have improved heat tolerance. However, there is a need to further test these lines further and see how they compare to commercially available cultivars (particularly when mowed at greens height they will be maintained in the real-world). Furthermore, identifying the underlying physiological mechanisms will assist in future selection of genotypes and provide a greater understanding into the biology of heat tolerance.

Objectives:

- Screen creeping bentgrass (*Agrostis stolonifera* L.) lines for heat tolerance at Griffin, Georgia to confirm the exceptional abiotic stress tolerance in experimental lines, as compared to commercial cultivars currently on the market.
- Understand the physiological mechanisms which are being utilized in top performing lines which leads to differential levels of stress tolerance during Georgia summers.

Results to date:

Due to issues with establishment a no-cost extension had been requested (letter sent 9/9/2019) in order to replant the trial and collect the required data to meet the project objectives. A combination of factors including challenging weather, disease, and poor establishment resulted in poor stands unsuitable for appropriate data collection (Fig 1.). During the fall of 2019, plots will be replanted, and with the no-cost extension, two years of data will be collected in 2020 and 2021. Limited data collected in 2019 supports that there is a range of heat tolerance in experimental lines which may surpass what is currently available on the market (Fig 2.). However it is worth reiterating that due to the previously mentioned issues this data should be interpreted with caution. Although delayed, we remain optimistic we will complete our objectives and generate important data on creeping bentgrass heat tolerance in the Southeast.

Figure Legend:

Fig. 1 – Image depicting demonstrating the severe decline in turf plots

Fig. 2 – Visual quality ratings during August 2019, indicating potential differences in performance among creeping bentgrass lines.

Figure 1.



Figure 2.

