

# Production and Maintenance of Triploid Interspecific Bermudagrass Hybrids for QTL Analysis



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## Objectives:

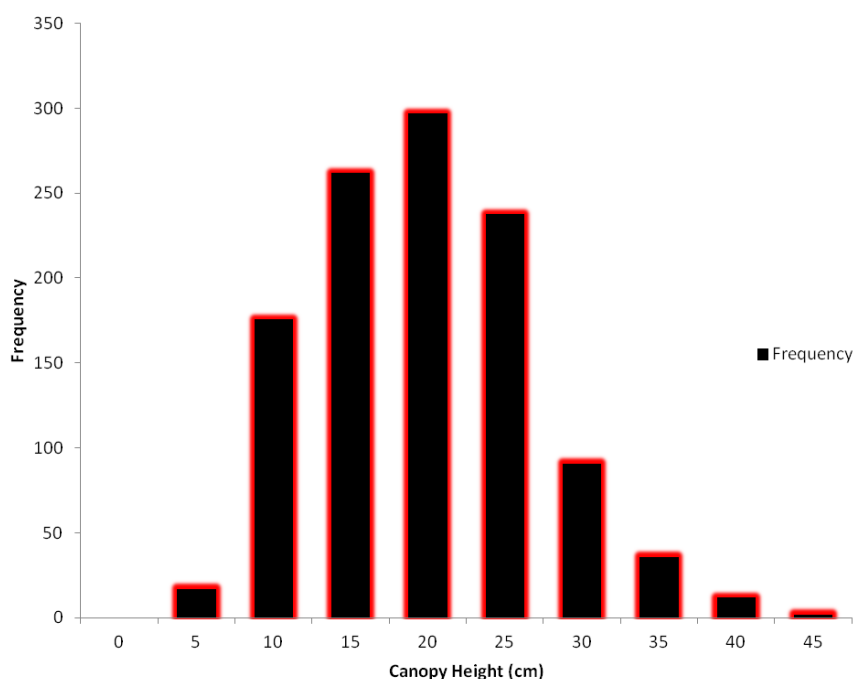
1. To evaluate the B17 F1 mapping population in replicated tests at Tifton, GA and Griffin, GA for turfgrass performance characteristics with the goal of identifying quantitative trait loci (QTL) for these traits.
2. To increase the size of the B17 F1 mapping population to 200 or more individuals.

A framework genetic map was created using single dose restriction fragments (SDRF) by Bethel, Sciara, Estill, Bowers, Hanna, and Paterson in 2006. In 2010, seventy-five simple sequence repeat (SSR) and 70 expressed sequence tag (EST) markers were identified to assess genetic diversity, identify cultivars of bermudagrass including those cultivars derived from 'Tifgreen', confirm pedigrees, and differentiate contaminants from cultivars. In the field, two replicated field trials of the B17 F1 mapping population were planted in Tifton and Griffin, GA to assess the phenotypic variation of these bermudagrass plants as observed in two distinct environments.

A number of traits will be measured or estimated in Tifton and/or Griffin, GA over the duration of this experiment. They include the length of the longest stolon during growth, stolon internode length, leaf width, leaf length, plant canopy height in the absence of mowing, seedhead density, number of racemes per flower, raceme length, number of spikelets per raceme, % green color, genetic color estimated with digital image analysis, plot color, turf density, turf quality, spring green-up, fall dormancy, and the variation of anthocyanin content between individuals within the mapping population. The majority of our efforts during 2012 were focused on measuring stolon internode length (2268 measurements), leaf width (2268 measurements), leaf length (2268 measurements), plant canopy height (756

measurements), seedhead density (counted seedhead number in a 1' x 1' sample area on 756 plots), seedhead culm length (2268 measurements), number of racemes per flower (records on 2268 seedheads), raceme length (approximately 6804 measurements), number of spikelets per raceme (counting between 30 and 250 spikelets on 2268 seedheads), spring greenup (756 digital pictures evaluated), summer turf quality (756

Figure 1. Unmowed canopy Height.



ratings), genetic color (756 digital pictures evaluated), turf density (756 ratings), and fall dormancy (756 digital pictures will be evaluated). The majority of these measurements and ratings are finished, but have not yet been entered into spreadsheets. Seedhead morphological characteristics will be measured this fall and winter on samples which were collected at maturity during the growing season and have been dried down for long-term storage. Figures 1 through 5 are frequency diagrams of unmowed canopy height, seedhead density, seedhead culm length, raceme length, spikelets per raceme measured in Tifton, GA during 2011.

### Summary Points

- 25,704 different measurements, counts, or ratings were made on individuals of the B17 F1 mapping population in replicated tests planted on the Tifton and Griffin Agricultural Experiment Stations during 2012.
- At the conclusion of this research, most traits will have been quantified or rated in-between two and six unique environments (two locations over three years). This data will be used to search for the gene(s) that regulate these traits.

