

Production and Maintenance of Triploid Interspecific Bermudagrass Hybrids for QTL Analysis



Brian Schwartz
University of Georgia

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Objectives:

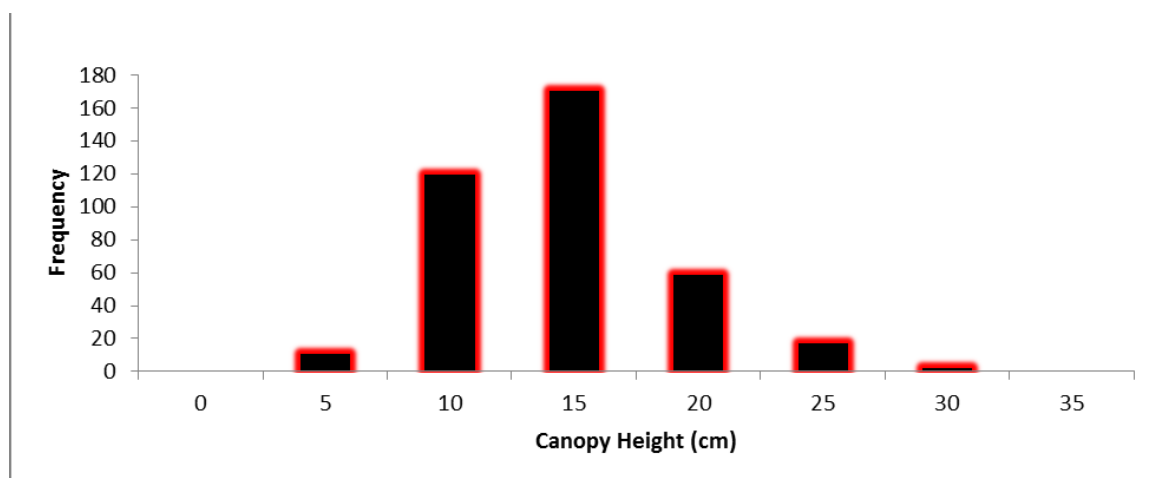
1. To evaluate the B17 F1 mapping population in replicated tests at Tifton, GA and Griffin, GA for turfgrass performance characteristics with the goal of identifying quantitative trait loci (QTL) for these traits.
2. To increase the size of the B17 F1 mapping population to 200 or more individuals.

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 were measured or estimated in Tifton and/or Griffin, GA over the duration of this experiment from 2010 – 2013. They included the length of the longest stolon during grow-in, 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, and fall dormancy for individuals within the mapping population. The majority of our efforts during 2013 were focused on measuring and entering data for stolon internode length, leaf width, leaf length, plant canopy height, seedhead density (counted seedhead number in a 1' x 1' sample area), seedhead culm length, number of racemes per flower, raceme length, number of spikelets per raceme, spring greenup, summer turf quality, genetic color, turf density, and fall dormancy. 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 2012.

Figure 1. Unmowed canopy Height, Tifton, GA (2012).



Summary Points

- 55,944 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 from 2010 through 2013.
- At the conclusion of this research, the measured traits were quantified or rated in two to six unique environments (two locations over three years). This data will be used to search for the gene(s) that regulate these traits and to estimate the heritability of these traits in this mapping population.

