

Evaluation, Selection and Production of Turf-Type Bahiagrass

Kevin Kenworthy, Ken Quesenberry, Bryan Unruh, Ann Blount,
Fredy Altpeter, and Esteban Rios
University of Florida



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Objectives:

1. Continue to evaluate the bahiagrass genotypes at three locations in Florida for their phenotypic value.
2. Evaluate the mutagenic genotypes for their mode of reproduction and seed production characteristics.
3. Evaluate the potential to establish bahiagrass by sprigs.

Phenotypic Value Evaluations

Plots of all UF experimental turf-type bahiagrasses were planted at three locations in Florida. The plots were visually rated for percent establishment and once established, for color, density, turf quality, fall color, spring greenup, and inflorescence density. Additional evaluations will be conducted in winter and spring of 2014-15 on these plots, but as selection of superior lines has been made these plots will primarily be maintained for observation purposes and possible identification of additional superior lines.



Single spaced plant plots of WEMS12 mutant turfgrass bahiagrass. Note fine texture and high shoot density.

Selection & Testing of Superior Lines

Ten superior lines were identified and vegetatively propagated, along with the two parental lines, for planting in two experiments. Experiment 1 (10 x 10 ft plots at PSREU) will evaluate rate of grow-in and cover, turf quality, and other phenotypic value attributes and then will be used to harvest sod to evaluate sod lifting quality and sod installation success of the lifted sod. Experiment 2 consists of 4 x 4 ft plots and was planted in a shade

house under 60% shade cloth. In addition to these plots at PSREU, Citra, FL, a set of 36 plants of the selected lines were shipped to Albany, OR, under a materials transfer agreement to obtain seed production data on these lines under a long day, low humidity growing environment in the Willamette Valley seed production area of Oregon.

Evaluation of M2 Progeny

M2 progeny from a sample of these selected lines were evaluated in a GH experiment in fall and winter of 2013-14. These progeny were then maintained in small pots and transplanted to the field at PSREU on 3 September 2014 to further evaluate uniformity/ segregation under field conditions in 2015. These progeny are planted adjacent to Exp. 1 and will be compared to performance of the parental source lines.

Embryo Sac Observations

The mode of reproduction of 30 genotypes taken from the original field experiment was determined by cytoembryological observations of ovaries collected at the time of anthesis. Nine of the ten superior lines selected and Argentine and Wilmington were evaluated. Argentine, Wilmington and all mutants developed from these parents showed a high frequency of apomictic embryo sac development. The three wild type lines were more variable in their mode of embryo sac development and would be classified as facultative apomictic lines. Additionally, these lines showed more sexual embryo sac expression during early and late flowering with a higher expression of apomictic sacs in mid-summer.

Digging and Planting Sprigs

A preliminary greenhouse sprigging experiment was planted in September 2014. Sod pieces were dug from the original field experiment, broken apart into 1 to 2 inch stolon pieces and planted in flats in USGA-spec sand. Preliminary results suggest that the Wilmington mutants and parent have poor emergence of shoots from stolon pieces, and but one Argentine mutant and a wild type line had good emergence. This data suggests that some lines have potential for sprigging. Sprigging potential will also be evaluated in 2015 using the plots in Experiment 1. Research in 2015 will focus on best propagation methods for the different mutants.



Plot of WEMS12 comparing performance in non-mowed vs mowed management. Note dark green color, high density, and turf quality of mowed half of plot. Also note that non-mowed half of plot has no seed heads. Compare to surrounding plots of other entries that are lighter green in color and have abundant seed head production.

Summary

- The collection of bahiagrass mutants and wild type lines has been characterized for various phenotypic value traits and based on this we have selected a group of superior genotypes, vegetatively propagated these genotypes, and planted them in larger plots to fully characterize these genotypes for turf potential.
- These genotypes will also be evaluated for ability to regenerate complete cover of the sod field from either remaining sod ribbons or sprigs after sod is removed.
- Reproductive mode and reproductive efficiency of these genotypes has been completed (reproductive mode evaluation still needed on one genotype). All genotypes will also be evaluated for seed production potential in Oregon.
- Attendees (approximately 150) at the North Florida Turfgrass Field Day (October 8, 2014) were shown the newly planted plots of the selected genotypes, and the USGA was recognized with signs indicating the grant support of this research.