Buffalograss Germplasm Improvement and Management

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Objectives:

1. Breed, select, and evaluate seeded and vegetative genotypes with improved turfgrass quality, pest resistance, and stress tolerance.
2. Improve our basic knowledge of the genetics of buffalograss through modern molecular marker technologies.
3. Expand understanding and use of efficient management practices for best genotypic performance.
4. Develop protocols for best turfgrass establishment.

Start Date: 2006
Project Duration: three years
Total Funding: $90,000

In 2009, several experiments were conducted to address these objectives. Crossing block consisting of 21 single crosses were tested for crossing compatibility and seed yield potential. Significant differences were observed among the single crosses tested for yield and yield components. As the result, high yielding compatible parents were identified. Some progenies of these parents were established to assess their turfgrass performance.

Advanced lines IV consisting of 104 entries including standard checks were evaluated for spring green-up, stand density, turfgrass color, and turfgrass quality in 2009. Significant differences were observed for these traits among the genotypes tested. Evaluations will continue for a several more years to identify the best genotypes for potential future release.

Similar data were collected on selections consisting of over 1,500 entries that were obtained from collections and hybridizations. Visual differences were observed though they were not replicated and analyzed. Evaluation will continue to identify and promote genotypes with superior turfgrass performance for a future advanced line replicated trial. In 2009, an additional 129 genotypes were added to the selections evaluations from collections made from diverse environments and management conditions. Some of these genotypes have potential shade tolerance and have been placed in a shade tolerance evaluation.

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USGA's research committe members view improved buffalograss selections at the University of Nebraska.

Buffalograss best performance is achieved when optimum management practices such as fertilizer rates, mowing heights, and irrigation rates are identified and met for the grass. Significant differences in turfgrass color and quality were observed among buffalograss genotypes in a mowing height by nitrogen nutrition evaluation. Data from this evaluation are being summarized for publication.

Attempts to establish buffalograss turfs from sprigs have been limited and successful stand establishment has been inconsistent. A study was conducted to determine whether accumulated growing degree-days (GDD) of harvested sprigs and cultivar have an effect on buffalograss sprig establishment. Two field studies were conducted on a Tomek silty-clay loam (fine smectitic mesic Pachic Agriudolls). 'Legacy', a hexaploid, and 'Prestige', a tetraploid, were used in this investigation.

Sprigs harvested at 1,050 GDDs resulted in the best establishment for both vegetative cultivars. Results from this study will be useful in vegetative establishment of larger turfgrass areas, like fairways and roughs, using buffalograss sprigs.

Summary Points

- Buffalograss germplasm was enriched through collection and hybridization.
- Among the elite buffalograss genotypes evaluated at diverse environments, several had wide adaptation potential.
- Best compatible high yielding buffalograss parents were identified for future hybridization and cultivar development.
- Mowing height and N nutrition rates influenced buffalograss turfgrass performance and adaptation though interactions were not significant.
- Study results support the recommendation to establish buffalograss from sprigs harvested prior to 1,050 growing-degree-days.