

Germplasm Development and Management for Buffalograss Varieties

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Objectives:

1. Acquire additional germplasm through collection and recombination of germplasm already in our collection.
2. Evaluate germplasm with superior turfgrass characteristics including mowing tolerance, color, length of growing season, insect resistance, establishment and recovery of vigor, sod strength, combining ability, and seed production.
3. Obtain inheritance data on important traits, conduct genome size and molecular marker analyses, and evaluate the impact of inbreeding and genetic diversity on variety development.

Start Date: 1998

Project Duration: 5 years

Total Funding: \$200,000

Buffalograss (*Buchloe dactyloides*) can offer excellent turfgrass quality in arid and semi-arid regions of the United States with substantially less water and other management inputs. The University of Nebraska continues its breeding program for buffalograss to improve germplasm for use in seed propagated varieties.

Performance data from the 1999 breeding nursery shows excellent progress on development of low-mowing tolerant buffalograss. Numerous accessions in this nursery have exhibited increased establishment rate over commercially available cultivars.

Newly released cultivars continue to show their superiority over older varieties with improved sod strength, color, turfgrass quality, and density. A number of the advance selections have been planted in Texas at Bamert Seeds for observations for turf, seed production characteristics and southern adaptation.

The first crossing block plantings were harvested in 2000. Seed from these blocks



Dr. Terry Riordan, University of Nebraska, has developed new vegetative and seeded buffalograss cultivars that will persist under fairway cutting heights.

will be germinated this winter in the greenhouse and planted to turf nurseries in the spring of 2001. Ploidy levels will be determined from these plants in the next few months. Numerous selections appear to have very good seed yield and turf characteristics.

Buffalograss seed production has received major attention in 1999 and has continued into 2000. To insure the successful use of buffalograss, seed production characteristics must be a major factor in the selection process.

The buffalograss project has initiated a three-phase approach to provide high quality turf varieties with high seed yields. Phase one involves breeding of high yielding female lines with advanced male accessions that contribute to seed yield, seedling vigor, and turf performance characteristics. The second phase is the use of flow cytometry to identify crossing accessions of similar ploidy levels. The third phase is to explore chemical applications of plant hormones to enhance seed production.

The development of turfgrasses with resistance to insects offers an attractive approach for managing insect pests associated with buffalograss because it is sustainable, environmentally-responsible, and fits well with buffalograss' low maintenance, reduced pesticide input philosophy.

Greenhouse experiments were conducted to determine the categories of resistance of 10 buffalograss cultivars/selections ('Cody', 'Tatanka', '609', '315', '378', 'Texoka', NE84-45-3, NE91-118, NE86-120, NE86-6 1) screened previously for resistance to the chinch bug, *Blissus occiduus*.



Improved collection of buffalograss genotypes mowed at fairway cutting height.

From these initial greenhouse screenings, 'Cody', 'Tatanka', and NE91-118 were elected as resistant to *B. occiduus* and NE84-45-3 and '378' susceptible. Although these three selections have been identified as chinch bug resistant, further evaluation is needed to determine the categories of their resistance (antixenosis, antibiosis, and/or tolerance).

Summary Points

- Excellent progress toward low-mowing fairway types and good seed types are under evaluation in Texas.
- Native Turf Group (NTG) had a good year and sold out of buffalograss seed. Tatanka was dropped due to low seed yields
- NTG-6 released and seed is available.
- Seed West and Bamert will develop varieties with the University of Nebraska.
- Legacy (86-61) was released and is under production by Todd Valley Farms, Inc.
- Developed three-phase plan to improve seed production: high yielding female lines mated with advance male accessions, flow cytometry to match ploidy levels, plant hormones to enhance seed production.