

# Breeding, Evaluation and Culture of Buffalograss for Golf Courses

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## **Goals:**

- *Develop vegetative and seeded turf-type buffalograsses that conserve energy and water.*
- *Develop buffalograss establishment protocols and management systems to provide acceptable golf course rough and fairway turf with significantly reduced cultural inputs.*
- *Determine the range of adaptation of turf-type buffalograss.*
- *Evaluate potential insect and disease pests of buffalograss.*
- *Evaluate physiological and biochemical principles of environmental stress and nutrient utilization in buffalograss.*

## **Cooperators:**

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The current goals of the University of Nebraska buffalograss project are to improve germplasm and improve management of buffalograss for use in golf course turf, as well as other turf uses. Specifically, our objectives include selecting for exceptional turfgrass quality and color, heat and drought resistance, tolerance to low-mowing (for use in golf course fairways), insect resistance, and establishment vigor.

Overall, the top performers in our 1997 evaluations were NE91-118 and NE86-120 and NE86-61. A number of other accessions have shown great potential in low maintenance and low mowing evaluation trials and will be evaluated further and in larger plot areas. These include NE93-185, NE93-181, NE-91-181, and NE93-170. Three of these accessions are males, which now can be used in seeded varieties or recombination blocks. Identification of superior male germplasm has been an important objective in our recent breeding efforts. NE93-181 is a good compromise between summer color and fall color, ranking high in both categories. Many quality accessions have been included in new crossing blocks to evaluate F1 hybrid potential and for use in genetic studies.

Low mowing tolerance is an important selection criteria for part of our program. NE86-61, NE86-120 have both performed well under low-mowing conditions as well as several other newer accessions. Our efforts have turned to identifying additional germplasm to allow for further improvement and to study the genetics of

low-mowing tolerant traits. In an evaluation of progeny families, ND86-61 and NE85-648 gave the best overall summer ratings and vigor characteristics, which follow parent performance. Families with desirable and uniform progeny performance will be evaluated for use in seeded cultivars tolerant to low mowing.

Buffalograss management research has shown management of 378 and NE 91-118 is best at 2.5 or 5.1 cm mowing heights and a nitrogen rate of 10 g N m<sup>-2</sup> year<sup>-1</sup>. Recommendations for *CODY* and *TEXOKA* are 5.1 or 7.6 cm mowing heights and a nitrogen rate of 10 g N m<sup>-2</sup> year<sup>-1</sup>. A field study was initiated to further study effects of management on buffalograss to determine the quantity and turn-over rate of soil and fertilizer nitrogen in above-ground vegetation, thatch, roots, and soil for buffalograss and two other turfgrass species.

We now routinely use flow cytometry to evaluate ploidy level of accessions used in our program. Most are hexaploid (60 chromosomes) but a significant number are tetraploid (40 chromosomes). One pentaploid (50 chromosomes), cultivar 315, was observed. This is the first record of a

pentaploid buffalograss. Interestingly, 315 is fertile, and is a parent in the seeded variety *TATANKA*. When the NTG seed producers began reporting poor seed harvests and management problems, we began to suspect genetic causes due to the pentaploid parent(s). We are studying this variety for chromosomal irregularities and inbreeding depression.

Total numbers of beneficial arthropods collected from buffalograss sites maintained at the high and low management regimes were not significantly different, suggesting that beneficial arthropods can be conserved over a fairly wide range of buffalograss maintenance levels. This information will be valuable for implementing site specific management practices that preserve existing natural enemies.

Patents have been filed for new releases NE 86-61, NE 86-120 and NE 91-118. Official UNL release statements will be finished by December 15, 1997. Sales for 1997 of 609 will be approximately at the 1996 level, or \$1.5 million dollars. Sales have continued to increase for 378 from Todd Valley Farms.