Selection of Turf Type and Seed Production in Inland Saltgrass (*Distichlis spicata*)  
*Colorado State University*

As potable water source availability becomes more limited for turfgrass irrigation, turfgrasses must be developed that can tolerate higher and higher salt levels in the irrigation water. Researchers at Colorado State University are developing turfgrass lines of saltgrass for use in salt-affected sites. They are documenting morphological characteristics of several lines that would make those lines likely candidates for cultivar development. Evaluation of 190 clones of saltgrass demonstrated that high seed production is possible with selection of the better lines. Selected lines had yields greater than 1000 lbs/acre. Seed scarification is necessary to obtain uniform and high germination percentages. Saltgrass exhibited good green color and high flower production under drought conditions when buffalograss, blue grama, crested wheatgrass, and bermudagrass turned brown. Saltgrass can be separated into 3 broad categories based on chromosome numbers of $2n = 4x = 38$, $2n = 4x = 40$ and higher levels of $72^+$. Saltgrass plants found generally east of the Rocky Mountains ($2n = 38$-chromosome plant type) appeared to have more vertical oriented leaf angles while those west of the Rocky Mountains ($2n = 40$-chromosome type) appeared to have more horizontally oriented leaf angles.

Germplasm Development and Management for Buffalograss Varieties  
*University of Nebraska*

Buffalograss can offer excellent turfgrass quality in arid and semi-arid regions of the United States using substantially less water and other management inputs compared to other turfgrass species. The University of Nebraska continues its buffalograss breeding and management program to improve buffalograss germplasm and culture. Numerous selections in this program have exhibited increased establishment rate compared to commercially available cultivars. New cultivars also exhibit superior sod strength, color, turfgrass quality, and stand density. The major effort in 2001 was to transform buffalograss using biolistic bombardment with the goal of making buffalograss Roundup resistant. Legacy was selected as “mail order plant of the year” by a major mail order trade organization. Observations in 2001 indicate that the best vegetative cultivars can be maintained at fairway mowing heights and still tolerate normal traffic, as long as conditions are dry. To date, nitrogen application rate is not a major factor.

Hybrid Bermudagrass Improvement by Genetic Transformation  
*North Carolina State University*

Hybrid bermudagrass is an important grass species for the putting greens, tees, and fairways in the southern United States. While conventional breeding programs have created superior hybrid bermudagrasses, a biotechnological approach can help the germplasm enhancement of the species as well as to directly contribute to the improvement of important agronomic traits. North Carolina State University researchers are developing tissue culture conditions for generating bermudagrass callus so that it can be used to obtain transgenic plants. Regeneration of bermudagrass plants through tissue culture has been further improved by adjusting plant hormones in the culture medium. A full course of secondary somatic embryogenesis has been photographed under a stereo microscope by tracking an embryogenic callus for more than 70 days. Transformation procedures using gene gun and *Agrobacterium* have been developed. A total of 19 putative transgenic callus lines were obtained by selection with hygromycin B (250 mg/L) or bialaphos (5 mg/L). Some callus lines also showed GUS reporter gene activity. Transgenic nature of some lines have been confirmed by Southern Hybridization Analysis.