Breeding and Evaluation of Turf Bermudagrass Varieties

Oklahoma State University

Charles M. Taliaferro

Start Date: 1998
Number of Years: 5
Total Funding: $124,978

Objectives:

1. *Assemble and evaluate Cynodon germplasm accessions for important descriptors. Incorporate descriptor information and accessions into the National Plant Germplasm System. Maintain a working collection of germplasm accessions with breeding value and utilize in turf bermudagrass breeding program.*
2. *Improve bermudagrass breeding populations for seed production potential, cold tolerance, and other traits conditioning turf performance.*
3. *Identify bermudagrass parental plants with superior combining ability for use in producing inter- and intra-specific F1 hybrid.*
4. *Develop, evaluate and release seed- and vegetatively propagated turf bermudagrass varieties.*

The turf bermudagrass breeding program at Oklahoma State University seeks to develop improved seed- and vegetatively-propagated cultivars for the transition zone. Specific goals of the project are to: 1) assemble and evaluate Cynodon germplasm accessions for important descriptors, 2) improve bermudagrass breeding populations for seed production potential and traits conditioning turf performance, and 3) identify bermudagrass parental plants with superior combining ability for use in producing inter- and intra-specific F, hybrids.

Recurrent selection (RS) for turf performance traits was continued in broad genetic base *C. dactylon* populations in 1998-99. RS in these populations has increased turf quality, transition zone adaptation, and seed production potential. Seed of 'OKS 91 -11', a cold tolerant variety for the upper south, is expected to be available in limited quantity in year 2000. The experimental synthetic seeded variety 'OKS 95-1' had turf quality equal to that of Tifway and Tifgreen in the 1997 NTEP trials for test year 1998. Additional plants were selected in 1998-99 from RS breeding nurseries to generate new populations. The most elite of these selected plants were used as parents in six new field polycrosses established in 1999 to generate experimental synthetic varieties.

Intra- and inter-specific crosses were made to generate F_1 progeny populations for evaluation as potential vegetativelypropagated hybrid turf bermudagrass cultivars. Approximately 2,000 F_1hybrid progeny from crosses made in 1998 were transplanted into field nurseries in spring 1999 for initial screening. Evaluations of F_1hybrids planted in screening nurseries in 1997 and 1998 continued through 1999. Plants from these nurseries will be selected in early spring 2000 for inclusion in replicated performance trials. Fifty F_1hybrid plants, selected over the past 4 years, are now in various stages of evaluation in replicated mowing studies. Additional fertile hybrids derived from 2n = 6x = 54 chromosome *C. dactylon* x 2n = 2x = 18 chromosome *C. transvaalensis* crosses have been obtained. These tetraploid (2n = 4x = 36 chromosome) plants have one full

genome (9 chromosomes) from *C. transvaalensis* and three full genomes (27 chromosomes) from *C. dactylon*. Open-pollinated and hybrid progeny from these plants have shown desirable turf characteristics.