

Breeding and Evaluation of Turf Bermudagrass Varieties

Charles M. Taliaferro
Oklahoma State University

Objectives:

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

Start Date: 1998

Project Duration: 5 years

Total Funding: \$124,978

The turf bermudagrass breeding program at Oklahoma State University seeks to develop improved seeded and vegetatively propagated cultivars for the transition zone.

We continued recurrent selection (RS) for finer leaf texture and increased seed yield in broad genetic base *Cynodon dactylon* populations. Elite plants from the populations are selected for use as parents in synthetic cultivars. Putative superior plants were identified in RS nurseries in 2000-2001 on the bases of seed set, turf quality, and adaptation. These plants will be intercrossed to advance cyclic selection and further evaluated for their potential use as elite parents in synthetic cultivars.

During the report period, syn-1 seed of six new experimental synthetic cultivars was produced and used to establish the cultivars in a replicated evaluation test at the OSU Turf Research Center. Isolated polycross plantings of four new synthetics were made in summer, 2001.

OKS 95-1 seeded bermudagrass was officially released as 'Riviera' in 2001 and licensed to the Johnston Seed Co., Enid, OK. Riviera is the leading cultivar in the current (1997 Test) NTEP bermudagrass trial. Results from field observations and laboratory cold tolerance testing indicate it to be slightly less cold-hardy than Yukon, but substantially more cold hardy than Arizona Common and similar types. We continued to use African bermudagrasses,



Dr. Charles Taliaferro is developing superior bermudagrass varieties at Oklahoma State University.

C. transvaalensis, selected for adaptation and turf quality features, extensively in crosses with *C. dactylon* tetraploid plants.

Select clonal parental plants were paired to produce mutually cross-pollinated seeds that will predominantly be of hybrid origin. Our goal is to produce at least 3000 putative hybrid seeds per year. A total of 118 hybrid plants, selected from screening nurseries established in 1999, were advanced to a replicated test to further measure turf performance. Preliminary selections were made in hybrid nurseries established in 2000. Approximately 15 dwarfed plants were selected from the 1999 and 2000 screening nurseries.

The F1 hybrid 'OKC 18-4' is ranked near the top (2000 mean rating of 6.3) in the 1997 NTEP bermudagrass test, being statistically exceeded in mean turf quality only by Riviera. It has $2n=4x=36$ chromosomes, but is highly infertile. Current data indicates it to be more cold tolerant than Tifway, Tifgreen, and Tifspout.

The advances in producing superior F1 hybrids are due to the development and identification of superior parents, both *C. transvaalensis* and *C. dactylon*. African bermudagrasses like '2352', '2567', '2570', and '3048' were the best of some 500 plants screened in tests on golf courses in the early 1990s. They have been used extensively as parents in crosses to selected *C. dactylon* parents. One-hundred and twenty new *Cynodon* germplasm accessions were obtained from the Peoples Republic of China in 2001.

Summary Points

- During the report period, syn-1 seed of six new experimental synthetic cultivars was produced and used to establish the cultivars in a replicated evaluation test at the OSU Turf Research Center.
- OKS 95-1 seeded bermudagrass was officially released as 'Riviera' in 2001 and licensed to the Johnston Seed Co.
- A total of 118 hybrid plants, selected from screening nurseries established in 1999, were advanced to a replicated test to further measure turf performance.