

Breeding and Evaluation of Turf Bermudagrass Varieties

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Objectives:

1. Collect and evaluate *Cynodon* germplasm accessions for important performance traits.
2. Maintain a working collection of *Cynodon* germplasm accessions with breeding value and utilize it in turf bermudagrass breeding.
3. Develop seed- and clonally-propagated turf bermudagrass cultivars for transition zone climates.

Start Date: 1998

Project Duration: 5 years

Total Funding: \$124,978

Turf bermudagrass breeding at Oklahoma State University is aimed at developing progressively improved seed- and clonally-propagated cultivars for the U.S. transition zone.

For seeded turf bermudagrass improvement, recurrent selection is practiced in broad genetic base *Cynodon dactylon* populations to improve turf quality, seed production, and adaptation features. Elite plants from the breeding populations are used as parents in synthetic cultivars. Recurrent selection is a powerful breeding procedure for incrementally improving plant populations for quantitatively inherited traits via increasing the frequency of genes conditioning the traits.

The progress made in breeding broadly adapted, high-quality, seeded turf

bermudagrass varieties is exemplified by 'Riviera' (OKS 95-1), a top performer in the 1997 NTEP bermudagrass trial. Riviera, licensed for production in 2001, had turfgrass quality in the NTEP trial equaling or exceeding all other entries.

Recurrent selection within breeding populations and the development of new experimental synthetic cultivars are ongoing components of the breeding program. Ten new experimental synthetic cultivars were developed and planted in replicated performance trials during 2001-02.

The breeding of clonally-propagated turf cultivars is accomplished by hybridizing selected *C. dactylon* and *C. transvaalensis* plants and identifying superior F1 hybrid plants. For both species, many plants currently used as parents are products of the breeding program or the germplasm acquisition effort, or both. Currently, approximately 1500 F1 hybrid plants are in preliminary evaluation nurseries and 125 F1 plants, selected during the past two years,

are in the first stage of replicated testing. 'Patriot' (OKC 18-4) turf bermudagrass was licensed to growers in Maryland and Oklahoma in 2002. Patriot was a high performing cultivar in the 1997 NTEP bermudagrass trial.

The breeding of seed- and clonally-propagated turf bermudagrass at Oklahoma State University has reached the threshold stage at which new cultivars can be developed at a faster pace with incremental improvements for important traits. The program seeks to develop and implement molecular genetics procedures as a means of increasing breeding effectiveness or efficiency, or both.

Evaluation is underway of 118 new *Cynodon* germplasm accessions from the Peoples Republic of China. The accessions are being evaluated for cytological, morphological, reproductive and adaptive characteristics. The new germplasm is an important addition to the present large working collection used in the breeding program.

Summary Points

- Seeded 'Riviera' and clonal 'Patriot' bermudagrasses were licensed for commercial production in 2001 and 2002, respectively. Both were among the top performers in the 1997 NTEP trial.
- Generation of breeding products is ongoing. Approximately 1,500 new F1 hybrid plants were field planted for initial screening. Additionally, 10 new seeded synthetic cultivars and 125 new clonal F1 plants were advanced to stage II screening in replicated performance tests.
- The addition of 118 new *Cynodon* germplasm accessions from the Peoples Republic of China is expected to significantly enhance the existing large working *Cynodon* collection at OSU.



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