

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 improved seeded-and clonally-propagated cultivars for the U.S. transition zone. Collection, evaluation, and maintenance of *Cynodon* germplasm helps accomplish that goal.

Progressive improvement of turf bermudagrass breeding populations is achieved by recurrent selection, a powerful breeding procedure for improving traits such as turf quality and cold tolerance, each controlled by many genes. The breeding of clonally propagated turf cultivars is accomplished by hybridizing elite *C. dactylon* and *C. transvaalensis* plants and identifying superior F₁ hybrid plants. The *C. dactylon* and *C. transvaalensis* plants used as parents to produce F₁ hybrids are products of the breeding program or the germplasm acquisition effort, or both.

The recently released 'Riviera'

and 'Patriot' seed- and vegetatively-propagated turf bermudagrass varieties, respectively, represent progress of the program. Initial commercial plantings of Riviera, a top performer in the 1997 NTEP bermudagrass trial, have performed well as far north as Kansas City. Riviera seed yields approaching 500 kg/ha (450 lbs/acre) have been achieved. The first commercial plantings of Patriot, also a high ranking performer in the 1997 NTEP trial, were made in the 2003 growing season.

Recurrent selection within breeding populations, the development of new experimental synthetic cultivars, and production of F₁ hybrid plants are ongoing components of the breeding program. During the past year, 10 new experimental synthetic cultivars and 125 F₁ hybrid selections were tested in replicated performance trials. Seed of one new synthetic was produced.

Twenty-eight elite plants were identified for use as parents in crosses to produce new experimental synthetic varieties. Forty-eight F₁ plants were selected from screening nurseries for advancement



'Riviera' bermudagrass on fairways of the Hidden Pines CC golf course, Warrensburg, MO

to second-stage testing.

The evaluations of 118 new *Cynodon* germplasm accessions from China for cytological, morphological, reproductive, and adaptative characteristics were ongoing over the past year. 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, and are achieving market success. Both were among the top performers in the 1997 NTEP bermudagrass trial.

- New breeding products were evaluated or generated in 2003. One hundred thirty-five F₁ hybrids and synthetic varieties were evaluated in replicated field performance trials. One new synthetic was produced.

- Twenty-eight plants in breeding evaluation nurseries were identified for use as parents in producing new synthetic or F₁ experimentals. New breeding nurseries were field planted containing several hundred plants.

- One-hundred-eighteen new *Cynodon* germplasm accessions from China are being evaluated and are expected to significantly enhance the existing large working *Cynodon* collection at OSU.



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