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: 2003 (current cycle)
Project Duration: three years
Total Funding: $75,000

Evaluations of cytological, morphological, and other performance traits were completed in 2004 for 127 *Cynodon* accessions from China. This collection contained accessions with desirable traits or combinations of desirable traits that will be valuable in the breeding improvement of turf bermudagrass. Of special interest are accessions with high fertility, high seed production potential, and high seed quality. Other desirable traits exhibited by some accessions included dark green color, relatively fine texture, good winter hardiness, and good sod density. In 2005, selected germplasm from this collection was used to form new populations and was also introgressed into existing cyclic breeding populations.

Selection traits for improved bermudagrasses include increasing sod density and strength.

*Thirty clonally-propagated interspecific (*C. dactylon *x* C. transvaalensis*) F_1 hybrid plants and two new seeded synthetic varieties were evaluated in a replicated test established in 2004 at the OSU Turf Research Center.*

Recurrent selection within breeding populations, the development and evaluation of new experimental synthetic cultivars, and the development and evaluation of interspecific (*C. dactylon* x *C. transvaalensis*) F_1 hybrid plants are ongoing components of the breeding program. Desirable plants were selected in 2005 from two seed-propagated bermudagrass selection nurseries established in 2004, each containing approximately 1,000 plants. Seed of eight new seed-propagated synthetic varieties was harvested from isolation polycross blocks established in 2004. The parents used in the respective synthetics were elite plants selected from cyclic breeding nurseries grown in recent years. New interspecific F_1 hybrids were produced using selected *C. dactylon* and *C. transvaalensis* parent plants.

Thirty clonally-propagated interspecific (*C. dactylon* x *C. transvaalensis*) F_1 hybrid plants and two new seeded synthetic varieties were evaluated in a replicated test established in 2004 at the OSU Turf Research Center. Many of these have performed well relative to standard varieties in evaluations of turf quality, winter hardiness, and sod strength. Other performance traits being evaluated include response to *Ophiosphaerella herpotricha*, the major causal fungal organism of spring dead spot disease, shoot density, and time for recovery from mechanical injury.

Summary Points

- *Cynodon* germplasm evaluated over the past four years contains desirable traits that will enhance the breeding of seed- and vegetatively-propagated turf varieties. Elite germplasm from this collection was used to form new breeding populations, introgressed into existing breeding populations used for cyclical selection, and crossing with *C. transvaalensis* to produce clonally propagated F_1 hybrids.
- Plants were selected from two cyclical breeding populations. The selected plants from the respective populations will be intercrossed in 2006 to advance the generations in the recurrent selection breeding process.
- Seed of eight new synthetic turf bermudagrass varieties was harvested from polycross blocks grown in isolation from other bermudagrass. The seed will be used to initiate performance testing of the synthetics beginning in 2006.
- Interspecific F_1 hybrids were produced from the crossing of selected *C. dactylon* and *C. transvaalensis* plants.