Breeding and Evaluation of Turf Bermudagrass Varieties

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Objectives:

1. Assemble, evaluate, and maintain *Cynodon* germplasm with potential for contributing to the breeding of improved turf cultivars.
2. Improve bermudagrass germplasm for seed production potential, cold tolerance, leaf firing resistance, and other traits that influence turf performance.
3. Develop, evaluate, and release seed- and vegetatively-propagated turf bermudagrass varieties.

Start Date: 2006
Project Duration: three years
Total Funding: $90,000

Turf bermudagrass [*Cynodon dactylon* (L.) Pers., *C. transvaalensis* Burtt-Davy, and their hybrids *C. dactylon* x *C. transvaalensis*] is the most widely used turfgrass in the southern USA and throughout tropical and warmer temperate regions of the world. The OSU turf bermudagrass genetic improvement program made progress in the enhancement of turf bermudagrass germplasm and the development of experimental cultivars in 2009. Screening of 1,080 putative F_1 progeny plants (*C. dactylon* x *C. transvaalensis*), field established in 2006, was completed in 2009 by selecting 14 superior progeny plants after evaluating winter color retention, spring green-up, winterkill, foliage color, texture, sod density, seedhead abundance, and overall turf quality for three years. The respective selected plants are being maintained in a greenhouse at the OSU Agronomy Research Station for use in establishing a replicated performance trial in 2010.

A field trial was continued to comprehensively evaluate eight OSU experimental synthetics for turf performance traits against clonal and seeded standard cultivars at the Turfgrass Research Center in 2009. Standard field performance parameters for fairway-type bermudagrass were assessed in this trial. In addition to the trial, two 2007-2012 NTEP ancillary bermudagrass trials inoculated with *Ophiosphaerella herpotricha* and *O. korrae* were continued in 2009. Tolerance to the disease will be assessed over the next three years in these trials.

Two 2007-2012 NTEP ancillary bermudagrass trials inoculated with respective Ophiosphaerella herpotricha, *and* O. korrae *were continued in 2009.*

Selected plants are being maintained in a greenhouse at the OSU Agronomy Research Station for use in establishing a replicated performance trial in 2010.

A clonal turf bermudagrass selection nursery encompassing 1,500 putative F_1 progeny plants of *C. dactylon* x *C. transvaalensis* field transplanted last year was screened for spring green-up, foliage color, texture, sod density, overall turf performance, and winter color retention in 2009. Large variations were observed in the progeny populations for various morphological, turf performance, and adaptation traits.

A broad-based breeding population formed by polycrossing tetraploid and desirable Chinese *Cynodon dactylon* germplasm accessions was evaluated for seed yield component and morphological traits to select approximately 10% superior individual plants as parents for the development of cycle one (C_1) population and to select elite parents to make new synthetic experimental cultivars in 2010. More recently, a new experiment was initiated to identify clonal turf bermudagrass cultivars using Simple Sequence Repeat (SSR) markers. Currently, more than 90 SSR markers were developed for bermudagrass and more than 200 SSR markers developed from mining and testing the expressed sequence tags (EST) of *Cynodon* in the National Center for Biotechnology Information. Three experimental lines, OKC 1119, OKC 1134, and OKS 2004-2 are in the 2007-2012 NTEP National Bermudagrass Test and exhibited outstanding performance.

Summary Points

- A set of 14 superior clonal bermudagrass putative hybrids were selected in 2009 from a screening nursery for next step in-house comprehensive evaluation.
- A field trial to comprehensively evaluate eight new experimental synthetics was continued.
- Spring dead spot disease tolerance evaluation was continued in 2009.
- A clonal bermudagrass nursery of 1,500 putative hybrids was evaluated for various traits in 2009.
- A new experiment was initiated to molecular identify clonal turf bermudagrass cultivars using SSR markers.
- OKC 1119, OKC 1134, and OKS 2004-2, experimental bermudagrass varieties had outstanding performance in the 2007 NTEP National Test.