

# 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

**B**ermudagrass is the most widely used turfgrass in the southern USA and throughout tropical and warmer temperate regions of the world. With USGA financial support, the OSU turf bermudagrass genetic improvement program made new progress in the enhancement of turf bermudagrass germplasm and the development of experimental cultivars in 2008.

Initial screening of 1,080 putative F1 progeny plants (*C. dactylon* x *C. transvaalensis*), field established in 2006, was continued in 2008 by evaluating winter color retention, spring green-up, winterkill, foliage color, texture, sod density, seedhead abundance, and overall turf quality. Large variations were observed for turf performance and adaptation trait descriptors. We will select the best 1-2% of the plants for advancement to a replicated performance trial under fairway management to begin in 2009.

A turf bermudagrass germplasm nursery, field planted in summer 2007, was fully established on the OSU Agronomy Farm in 2008. The germplasm nursery contained 298 genotypes consisting of original accessions from geographical regions in the world, selected promising



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breeding lines, and commercial standard cultivars representing *C. dactylon* and *C. transvaalensis* and inter-specific hybrids of the two taxa. A progeny selection nursery of a tetraploid bermudagrass population in initial cycle (C0) was planted in the summer 2008.

The broad-based breeding population was formed by polycrossing tetraploid and desirable Chinese *Cynodon* germplasm accessions. A second selection nursery consisting of approximately 1,500 clonal progeny plants was planted in the summer, as well. The putative F<sub>1</sub> hybrids plants were derived from inter-specific hybridizations of Chinese *C. dactylon* accessions (4x=36 and 6x=54) with elite OSU *C. transvaalensis* (2x=18) breeding lines. Plants in each of these two populations will be evaluated over the next 2 to 3 years for turf performance traits and for seed yield and seed quality traits for the Chinese tetraploid population.

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 2008. Standard field performance parameters for fairway-type bermudagrass were assessed in this trial. In addition to the trial, a 2007-2012 NTEP

ancillary bermudagrass trial was inoculated with *Ophiosphaerella herpotricha*, one of the casual agents of spring dead spot in fall 2008. A second 2007 NTEP ancillary bermudagrass trial was also inoculated with *O. korrae*, an additional causal agent of the disease, in 2008.

Tolerance to the disease will be assessed over the next four years in these trials as well as in a 2004-2012 comprehensive evaluation of 32 clonal selections. Preliminary testing of an in-field minilysimeter technique for water use rate was initiated on 20 bermudagrass varieties in fall 2008. These trials are managed under golf course fairway conditions.

## Summary Points

- A clonal bermudagrass selection nursery was evaluated and screened for turf performance and adaptation traits.
- Two new selection nurseries were field planted in 2008.
- A new turf bermudagrass germplasm nursery was fully established in 2008.
- A field trial to comprehensively evaluate eight new experimental synthetics was continued.
- Spring dead spot disease tolerance evaluation has been expanded in 2008.
- Water use rate testing of selection began in fall 2008.



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