

Development of Shade-Tolerant Bermudagrass Cultivars for Fine Turf



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Objectives:

1. *Cross bermudagrass selections screened for shade tolerance and fine turf qualities.*
2. *Establish progeny from seed and evaluate the progeny for shade tolerance, seed yield, and fine turf qualities.*
3. *Develop a shade-tolerant seeded bermudagrass cultivar(s).*
4. *Study techniques with potential for rapid selection of shade resistant bermudagrasses.*

Bermudagrass is the most popular turfgrass in the southern USA except for areas in full or partial shade. Bermudagrass has little tolerance for shade. However, it has been demonstrated that some cultivars of bermudagrass are more tolerant of shade than others. That leads breeders to believe that there may be hope for improving shade resistance in the species.

Research sites in full sun and partial shade were planted from greenhouse-grown bermudagrass plugs on June 22, 2007 at the OSU Turfgrass Research Center, Stillwater, OK. The study consisted of 45 common bermudagrass selections and four vegetatively propagated standards 'Celebration', 'Patriot', 'TifGrand' and 'Tifton10'. Through the growing seasons from 2008 through 2011 the 45 selections were screened for fine turf characteristics and shade resistance.

In 2011, selected clonal plants, 013, 023, 024, 028, 034, 035, 079, 116, and 118 were used in poly crosses. One single cross between 118 (shade tolerant) and 083 (shade sensitive) was field established. Seed from the poly crosses was collected in 2012 for planting in spring 2013. Additional field testing will begin in 2013.

Common bermudagrass is a highly outcrossing species with significantly enforced self-incompatibility. Each genotype is heterozygous at many loci and homozygous at the remaining loci of the genome. Recurrent selection methods are robust in improving target traits. Progeny plants in the populations will be evaluated for shade tolerance and related traits to advance the populations by selecting elite genotypes and forming new populations.

Figure 1. A polycross nursery of selected shade tolerant entries was managed to produce seed at Cow Creek Bottom of the OSU Agronomy Research Farm in 2012.



Summary Points

- Through the growing seasons from 2008 through 2011, 45 common bermudagrass selections were screened for fine turf characteristics and shade resistance.
- In 2011, selections were made from the shade study and planted for poly-crossing with seed harvested in 2012.
- Three polycrosses field established in 2011 produced ample seed for further testing in 2013
- One two-parent single cross was made to produce seed for segregation analysis and to map the genome for shade tolerance and related traits in the future.