

Improved Drought Resistance

The major warm season turfgrass species vary greatly in drought avoidance and in drought resistance with comparative rankings being much different than had been previously assumed. Variations in drought avoidance and recovery is as great within most of the turfgrass species as the variation at the interspecies level.

Physiological Basis of Minimal Maintenance Turfgrasses

Genetic diversity in terms of minimal maintenance turfgrasses can be statistically evaluated.

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Breeding and Development of  
Zoysiagrass

1985 Grant - \$42,000 (Third year of support)

The USGA/TAES Zoysiagrass Breeding and Development Program is a diverse, multifaceted approach to expand and improve existing cultivars of the Zoysia species. Constant observation of the plant collection reveals both the strengths and weaknesses of this turfgrass.

A taxonomic study of the Zoysia spp. germplasm was initiated to gain a better understanding of their breeding behavior. The genetic variability within the Oriental germplasm, collected four years ago in Southeast Asia with support from the USGA, continues to be evaluated in the field, greenhouse, and laboratory. Field notes were taken during the last year for fall color, growth rate, leaf type, spring greenup, flowering habit, percent cover, dormancy, and canopy temperature. Significant variation exists with the germplasm for all of these characters, and the probability of creating genotypes which possess favorable gene combinations are excellent. A test of the compatibility of the germplasm accessions was initiated during Spring 1985 in both the greenhouse and the field.

A commercially available Korean zoysiagrass seed stock was screened for tolerance to high soil temperatures and low soil moisture. Plants selected for superior performance during prolonged temperature and moisture stress, and those selected for their ability to recover from stress conditions differed significantly from an unselected base population. A field study using the selected and unselected populations was initiated to further examine the tolerance of this plant material to heat and moisture stress in the natural environment.

Attempts to produce single cross hybrids between individual zoysiagrass accessions were unsuccessful thus far. Several crossing techniques will be evaluated during the next year. A growth chamber constructed during the last year was useful in initiating plants to flower. Open-pollinated seedlings from 1983 and 1984 were planted to the field in Summer 1985. Eighty six families (i.e., the maternal parent and its open-pollinated offspring) were established in a replicated field trial to study the level of genetic variation for major agronomic characters, and provide accurate estimates of heritability. Such information is essential in determining the most effective breeding method to employ in cultivar development.

Forty cultivars were evaluated for sod strength and rate of regrowth after sod harvest. Three accessions have outstanding rhizome regrowth potential. These accessions and other cultivars will be planted into a new variety trial in Spring, 1986. A seed production trial was also initiated in August 1985 to help determine the potential for a seeded zoysiagrass variety.

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Breeding and Development of  
Bentgrass

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Susceptibility to heat stress limits use of bentgrass for high quality playing surfaces in the Southern and Central United States. In the fall of 1981, a group of individuals in the north Texas area interested in bentgrass established a fund-raising organization named Bentgrass Research, Inc., to support bentgrass research at TAES-Dallas. In October 1982, a 3600 square foot sand green was constructed by this group for research purposes. In April, 1984, the United States Golf Association, Bentgrass Research, Inc., and the Texas Agricultural Experiment Station joined in a concerted effort for the "Breeding and Development of Bentgrass". A limited collection of bentgrass germplasm had been assembled at TAES-Dallas over the previous four years. Most notably were individual plants which had survived naturally under Southern climatic extremes, often in direct competition with other species such as bermudagrass. In total as of November 1985, over 200 vegetative accessions from two countries and five states, 129 seeded accessions from nine countries, and five commercial varieties were included in the collection.