

that are relatively less susceptible to drought injury. This can be partially explained by the relationship between the degree of leaf firing and the ratio between the shoot proline level before and after water stress.

TEXAS A&M UNIVERSITY - Dr. M. C. Engelke  
Principal Investigator

Breeding and Development of  
Zoysiagrass

1986 Grant - \$40,000 [fourth  
year of support]

The zoysiagrass germplasm nursery continues to be maintained in both the greenhouse and in replicated field plots. The winter of 1985/86 was relatively mild, with very few of the zoysia accessions actually going dormant. Environmental parameters are being continuously monitored and visual observations recorded on relative plant performance.

Considerable emphasis was directed in 1985/86 toward identifying unique genotypes within the Oriental and Domestic zoysiagrass collections which appeared to be well adapted to turf conditions in the Southern United States. In the fall of 1985, several experimental zoysiagrass genotypes were selected from the 1980 turf trials, as well as from the Oriental zoysiagrass collection for inclusion in an accelerated field testing program. These genotypes have been and will be designated DALZ lines, to signify elite genetic resources. Of particular interest are two lines, designated DALZ8501 and DALZ8502 which are accessions from the Plant Introduction Station, Experiment GA in 1981. Data is presented in TABLE 5 to demonstrate the superior regrowth characteristics of these accessions over commercial or other experimental varieties. These two clones along with approximately 20 others are being increased in the greenhouse to provide sufficient plant material for establishment and extensive field testing beginning in 1987.

The occurrence of a rather severe nematode infestation resulted in a major delay in vegetative propagation of plant material. The nematode was identified as Meloidogyne sp. [root knot nematode], which apparently is relatively common on zoysiagrass. Regardless, the incident resulted in delayed planting of the experimental plots.

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Breeding and Development of Bentgrass

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Research, Inc. of Fort Worth, TX]

In April, 1984, the Texas Agricultural Experiment Station, Bentgrass Research, Inc., and the United States Golf Association embarked upon a joint endeavor to develop bentgrasses which are genetically adapted to environmental conditions in the southern United States. The germplasm collection currently includes over 520 vegetative accessions, 168 seeded accessions, 300 'Seaside' selections, and ten commercial or experimental varieties. Facility development to accommodate testing of this material has continued, with Bentgrass Research, Inc. constructing a new 1610 sq. meters [17,000 sq ft.] sand base research green, with completion expected by November 1, 1986. Field, laboratory and greenhouse experiments are progressing toward identification of superior genotypes.

Testing is currently in progress in a greenhouse heat bench to determine sensitivity of seven cultivars and two experimental varieties to heat stress. Initial results indicate differences do exist between genotypes. Characterization of root systems to identify plants which will avoid heat-induced drought stress continues. Forty-seven Seaside and Seaside-RHT plants have been screened, with fifty additional clones under current evaluation. Completed evaluations indicate differences exist between genotypes. A manuscript summarizing the results from the first evaluation was submitted to the Texas Turfgrass Research Report - 1986. Preliminary laboratory evaluations to determine if selection for root heat tolerance has influenced shoot heat tolerance indicate significant differences in shoot hydration exists between genotypes when grown under stress.

Field testing under both native blackland soils and root zone modified 'USGA sand based greens' conditions continue. Two-hundred thirty elite vegetative accessions were planted on blackland soil during May 1986, with turf quality ratings indicating approximately 25% of these express superior adaptive characters. In addition, approximately 25% of the ELITE genotypes planted on sand base green performed in a superior manner during 1986. Two-hundred ninety-four plants of Seaside and Seaside-RHT were planted during April 1986. Periodic evaluations indicated tremendous genotypic differences in spread, texture, density, color, and overall quality, with 46 clones ranking in the top quality group. Selection for root heat tolerance has not adversely affected the quality characters evaluated.

A project contract was established in 1985/86 with Dr. Jerry Pepin, and Pickseed West, Inc., Tangent, Oregon, to assist the breeding program in seed production of elite and synthetic germplasm resources. Floral initiation and development did not occur in the field plantings at Dallas during 1986, but was successful in Oregon. The plantings of elite germplasm in Oregon determined cross-compatibility dates for the genotypes, and generated sufficient seed quantities for advanced generation testing. Three synthetics have been composed and have been transferred to Oregon for 1986/87 production.