

Development of Stress-tolerant, Turf-type Saltgrass Varieties

David Kopec
University of Arizona

Objectives:

1. Evaluate new collections and first cycle of population improvement, select parents from the nursery, and intercross for the second cycle of population improvement.
2. Screen salinity tolerance among saltgrass advanced selections and determine the level of salinity tolerance during germination (seeded type only) and as mature turf for potential new cultivars.
3. Quantify cold hardiness of potential varietal releases, advanced lines, and breeding accessions.

Start Date: 2003

Project Duration: three years

Total Funding: \$65,842

Well Watered ET Study

Evapotranspiration buckets were established on two clones of saltgrass that had performed well during the previous three to four years as mowed, cloned turf plots in Tucson, Arizona when receiving minimal irrigation. Twelve lysimeters were planted to vegetative material. Lysimeters are 4" diameter X 12" deep PVC casings filled with calcined clay, which has moderate water holding capacity and excellent infiltration and drainage characteristics. Eight lysimeters will be used in the greenhouse ET (consumptive water use) study upcoming the spring of 2004.

Sod Production Technique for *Distichlis*

A pilot sod production technique is being evaluated for producing saltgrass vegetatively as a sod. The deep-forming rhizome habit of saltgrass presents a unique challenge since sod knitting is achieved through surface rooting of rhizomes, stolons, and roots. Propagation quantities for sod are also being evaluated.

Response to Traffic

Distichlis (saltgrass) has been observed on more than several locations as growing on highly compacted soil and



Large monolith lysimeters were transplanted to Tifway bermudagrass and to AZ 138 saltgrass to compare evapotranspiration rates (water use).

graveled surfaces. Clonal evaluations of the 1998 planting trial were conducted with half of the existing plots being rolled two to three times weekly with an 875-pound roller. All plots are now mowed at 1.0 inch, or less with a reel mower. Different clones (plant genotypes) have responded to traffic with various degrees of tolerance, ranging from poor (loss of color and/or stand density) to increased visual shoot density under traffic.

Drought Avoidance ET Study Preparations

Large lysimeter designs were evaluated from the literature based on detection precision, efficiency of use, construction costs, and implementation. Based on the literature and personal contacts, large weighing lysimeters will be constructed in the winter of 2004 which will have the detection limits of 0.25 mm per day (using a load cell), and a special particle mix size distribution of calcined clays.

These units will allow for precise volumetric water content determination as a function of cumulative reference evapotranspiration. Weighing lysimeters will be constructed in the winter of 2004, while corresponding field plots will be planted in the spring of 2004 for establishment evaluation

Large Monolith Lysimeters

The large monolith lysimeters were transplanted to a new surface of Tifway bermudagrass and to AZ 138 saltgrass. These lysimeters will fill in by the end of the summer of 2004. These lysimeters have a large surface area with an unlimited root depth and can be used to evaluate evapotranspiration (consumptive water use) and/or drought tolerance studies. Both lysimeters (with bermudagrass and saltgrass) can be irrigated with either effluent or potable water sources. The cover rate of saltgrass is slower than that of bermudagrass from plugs.



Weighing lysimeters allow for precise volumetric water content determination and subsequent water use.

Accession Collection Screening

A large field area has been selected (graded for flood irrigation) for establishing clonal material for evaluation under 1.0-inch mowing. This nursery includes the 2001 accessions from southern California and has room for selections derived from superior progenies derived from the Colorado State University breeding project. These plants will be transplanted in the field in the spring of 2004.

Summary Points

- A pilot sod production technique is being evaluated for producing saltgrass vegetatively as a sod.
- Different clones (plant genotypes) have responded to traffic with various degrees of tolerance, ranging from poor (loss of color and/or stand density) to increased visual shoot density under traffic.
- Weighing lysimeters will be constructed in the winter of 2004 which will allow for precise volumetric water content determination as a function of cumulative reference evapotranspiration.
- A large field area has been selected (graded for flood irrigation) for establishing clonal material for evaluation under 1.0-inch mowing.