

Breeding Seashore Paspalum for Recreational Turf Use

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Objectives:

1. Develop superior quality turf cultivars suitable for use on golf courses and recreational venues.
2. Document and improve disease resistance.
3. Further improve salt tolerance.
4. Develop improved weed management strategies.
5. Develop molecular tools to support breeding.

Start Date: 2006

Project Duration: three years

Total Funding: \$90,000

The University of Georgia turfgrass breeding program continues to make rapid progress towards the development of improved seashore paspalum cultivars. In 2007, approximately 3,000 single plants were screened for salt tolerance in the greenhouse and approximately 1,000 salt-tolerant individuals were later transplanted to field plots for further evaluation of turf quality and resistance to dollar spot. This approach allows our breeding program to efficiently evaluate large numbers of individuals for important traits.

Top performing lines from a 37-entry preliminary trial established in 2005 were increased in our greenhouses during the winter for entry into variety trials at Tifton and Griffin, Georgia, as well as the 2006 seashore paspalum NTEP trails at multiple locations across the U.S. This program of intensive screening followed by multi-state evaluations of turf performance should insure continued improvement in turf quality, disease resistance, and salt tolerance in our future cultivar releases.

Differentiating seashore pas-

palum cultivars has been a challenge since most cultivars used commercially are morphologically very similar to each other. The ability to accurately identify cultivars would be useful in protecting intellectual property (patented cultivars) and provide an extremely useful tool for verifying cultivars and confirming off-types during the certification process. Amplified fragment length polymorphism (AFLP) is currently the most commonly used method for DNA fingerprinting. Simple sequence repeats (SSRs) are growing in popularity and can be used in conjunction with AFLP for genotype identifications.

Using funding provided through the USGA and the Georgia Seed Development Commission, Dr. Zhenbang Chen has used AFLP and SSRs to fingerprint the most commercially available seashore paspalum cultivars, as well as all accessions in the USDA germplasm collection. The use of AFLP banding patterns has already proven to be useful as a new tool in resolving a number of industry issues related to cultivar identity and to quality control (identification of off-types) within our commercially released cultivars.

Dr. Bob Carrow is conducting both greenhouse and field studies to docu-



Dr. Carrow's research staff collect data during a dry-down period in a greenhouse experiment designed to document the level of drought resistance of our advanced lines.

ment the drought resistance of new paspalum lines coming through our breeding program. In these replicated studies, our most advanced lines are compared with commercial paspalum cultivars and 'Tifway' bermudagrass, the industry standard for drought resistance.

The field studies use small plots on a deep, sandy loam soil under our automated rain-out shelter, while the greenhouse experiments consist of established plantings of test entries in large PVC tubes. Data collected during repeated dry-down periods provide indications of water use, growth, and the ability to maintain turf quality during prolonged periods of water stress. This data will be considered in selecting new cultivars for release.

Summary Points

- Our current breeding approach makes it possible to evaluate thousands of individuals each year for traits of importance to the golf industry.
- DNA fingerprinting techniques developed in our labs provide us with an exciting new tool to clearly establish the identity and purity of our plant materials.
- Both greenhouse and field studies are being used to document the level of drought resistance of our advanced lines prior to consideration for release as cultivars.



Data collected from this preliminary trial at Griffin, GA comparing 37 experimental lines and five commercial cultivars was used to select top-performing lines for entry into the 2006 NTEP trials.