

Genetic Enhancement of Paspalum for Recreational Turf

Ron R. Duncan
University of Georgia

Objectives:

1. Off-site seashore paspalum ecotype evaluations with industry collaboration.
2. Creation of additional genetic diversity within the species.
3. Genetic profiling of ecotypes.

Start Date: 1998

Project Duration: 5 years

Total Funding: \$125,000

Three accessions were released from quarantine: one from South Africa, one from the Bahamas, and one from Belize. An additional seven ecotypes were collected during the year and are being increased in the greenhouse over the winter months for subsequent field evaluations in 2001.

Research is continuing on producing a seeded hybrid paspalum and collaboration continues with private seed companies in Oregon. Sea Isle 1 has been licensed to 24 growers in nine states with production at 33 sites in the U.S. The grass will be licensed internationally through an international broker working out of Canada.

Confront + MSMA is providing 70% suppression of paspalum encroachment into bermudagrass with minimal injury to the bermuda, but multiple applications will be needed to completely take out the paspalum. Bermuda encroachment into paspalum is more difficult, but Prograss + Cutless has provided more than 85% suppression. However, multiple applications are needed and paspalum injury has exceeded 50%, especially when air temperatures are greater than 85 F.

Insect resistance evaluation studies have revealed experimental 561-79, a selection

out of Argentina, that has broad-based resistance to most of the insect problems: mole crickets, armyworm, white grubs, spittle bugs. Outbreaks of fusarium blight, pythium blight, dollar spot, anthracnose, and *Helminthosporium/Curvularia* have been reported on the grass in field/golf course situations.

Potassium is a key defense strategy and should be maintained at high levels or spoon-fed on a regular basis. Soluble N can be supplied in a prescription format (fertiligation, small amounts put on frequently) to combat the dollar spot, with some follow up with fungicides. 'Sea Isle 2000' gets very little dollar spot and 'Sea Isle 1' gets less dollar spot than 'Salam' (Southern Turf proprietary cultivar).

Salinity tolerance assessments revealed that several ecotypes have excellent salinity tolerance and are true halophytes: HI 26, HI 36, HI 101, HI 10, HI 33, HI 14, and HI 8 were in the top grouping statistically. These ecotypes have the capability to function at 50 dS/m salt (ocean water is 54 dS/m). Salinity tolerance mechanisms were related to maintenance of total water potential and shoot K content, escalated proline synthesis, and inorganic ion uptake (K^+ , Na^+ , Cl^-). Multiple salt resistance mechanisms in this halophytic grass are functioning at higher salinity stress levels. Sodium is required as a micronutrient, and chloride is required as a macronutrient.

We now know the mechanisms involved in traffic tolerance in paspalum compared to bermudagrass. We have been able to ascertain the mechanisms of salinity tolerance. We have found parallel abiotic stress tolerances for salinity, drought, acid soils, and low light intensity among several cultivars. Management protocols are being tailored to water/soil/environmental interactions, with salt level as a primary determining factor.



Dr. Robert Carrow and Dr. Ron Duncan provide an overview of the University of Georgia breeding program to develop new seashore paspalums for golf courses.

The book *Seashore Paspalum - The Environmental Turfgrass* became available from Ann Arbor Press in June, 2000, and will be a vital reference source. The paspalum website (www.georgiaturf.com) will provide the bullet management points and new findings coming through the research program. Practical experience supplements will be added to the website as needed to update overall management protocols.

Summary Points

- ☐ Licensed one fairway type seashore paspalum (Sea Isle I) to 24 growers in 9 states.
- ☐ The release of a putting green is pending (tied up in litigation).
- ☐ Three accessions released from quarantine: South Africa, Bahamas, and Belize.
- ☐ A selection from Argentina, 561-79, has broad-based resistance to most insect problems.
- ☐ One hybrid (Hyb7 x Q36313) nicks well with other parental clones and produces a good amount of seed.
- ☐ More 2500 hybrid progeny were transplanted with about 400 plants from Hyb7 x Q36313
- ☐ Somaclonal variants did not outperform any of the parents from which they were generated.



Sea Isle 1 (formerly FYS-1) was released as an alternative for golf course fairways irrigated with poor quality water high in salts.