Selection of Turf Type and Seed Production in Inland Saltgrass (Distichlis spicata)

Harrison Hughes
Colorado State University

Objectives:

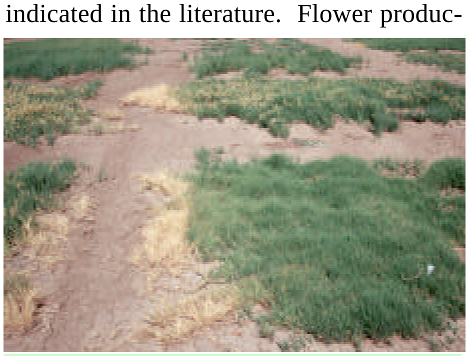
1. Determine turf performance of seven elite CSU-USGA lines, seven elite University of Arizona lines, and seven Great Basin lines from the University of Arizona.
2. Determine the range of stress tolerance (drought, salinity) present in inland saltgrass.
3. Determine seed production of seven elite CSU-USGA lines.
4. Evaluate Kopec collection and Northern Great Plains collection.
5. Evaluate seed germination and seedling vigor of all crosses.
6. Evaluate RAPD as a means of identifying unique genotypes of saltgrass.
7. Determine the relative chromosome number of elite clones.
8. Study the viability and germination requirements of inland saltgrass seed.
9. Evaluate seed priming as a possible method by which germination can be improved.

Start Date: 1998
Project Duration: 5 years
Total Funding: $125,000

In the evaluation of selected lines for turf performance, Great Basin lines exhibited winterkill and are being replaced by selected lines derived from seed collected from Modoc, California. The clones A138 & A55 had the highest shoot densities and overall turf appearance while the CSU-USGA had the lowest shoot densities with the exception of C10 & C8.

Seed production of the seven elite CSU-USGA lines was observed to be high as compared to last year. The application of a burn treatment to half the plots during the last two years did not appear to result in differences from those plots not burned.

The evaluation of the 190 clones in our germplasm nursery demonstrated that saltgrass is not a poor seed producer as indicated in the literature. Flower production was high in 2000 during a drought when buffalograss, blue grama, crested wheatgrass and bermudagrass plots were browning and only saltgrass remained green. All single crosses among 15 females and 11 males selected for high number of racemes, apparent rust resistance and short height were made. These crosses will be evaluated in the coming years.



Several inland saltgrass genotypes show promise as low maintenance rough in areas with poor soil and water quality.

We are continuing to make chromosome counts for new collections and accessions selected for parents in the breeding program. The pattern of broad regional separation of plants with chromosome numbers of 2n=4x=38 and 2n=4x=40 reported previously remains unchanged with additional counts from plants collected in Colorado, Utah, Kansas, and Arizona.

Athough plants with 74 chromosomes occur at a frequency of greater than 10% in our collections from regions of both 38- and 40-chromosome plants, within-region variations of these tetraploid numbers have not been observed.

Saltgrass plants with 40 chromosomes and polyploids found in the same region have been generally observed to have more horizontally-oriented leaves than plants with 38 chromosomes or polyploids within the same region which are more verticle. Although leaf angle varies within these regions there appears to be a general relationship.

An evaluation of mechanically scarified seed as compared to hand scarifed seed showed no differences in germination, but scarification improved germination. Field tests were mixed with a low vigor seed source having greater germination of nonscarifed seed while high vigor seed showing similar results as laboratory tests.

At Colorado State University, Dana Fry points out the aggressive growth of an inland saltgrass accession.

Summary Points

☐ Examination of 190 clones demonstrated that saltgrass is not a poor seed producer.

☐ Seed scarification increased seed germination.

☐ Flower production was high in 2000 during drought; better than buffalograss, blue grama, crested wheat, and bermudagrass.

☐ Great Basin and Utah lines winterkill in Colorado.

☐ Chromosome number 2n = 4x = 38 and 2n = 4x = 40, a few 2n = 74.

☐ CSU-USGA lines had low density and turf quality, but seed fertility of seven elite lines was high.