Regionally-Adapted Alkali Sacaton (*Sporobolus airoides*) Allows for a Market-Based Approach to Rangeland Restoration in Southern Nevada

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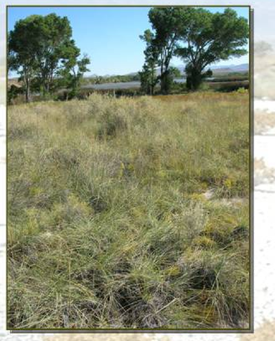
In order to increase the success of restoration efforts in the harsh and unpredictable climate conditions of arid western rangelands, adapted ecotypes for restoration are in high demand. Using ecotypes collected from areas of proposed use can be prohibitive due to their limited range of use and cost of seed production. In contrast, regionally-adapted plant materials, composed of multiple source-identified ecotypes, allows commercial seed growers to produce seed adapted to larger areas, with greater potential markets. The purpose of this project is to produce a single population from multiple ecotypes, adapted to the area of proposed use and available at an economical price.

The setting for this project is southern Nevada, where increasing threats of urban development, invasive species and wildfires warrant the need for an abundant, highly adapted seed source for large-scale restoration. In collaboration with the Southern Nevada Restoration Team (SNRT), composed of the four primary federal agencies managing 90% of this region, and funded by the BLM-Las Vegas Field Office, the NRCS Tucson Plant Materials Center began in 2004 to address this region's need for adapted native seed with a market-based approach. The goals of this project were to: (1) produce a genetically diverse alkali sacaton (*Sporobolus airoides*) population adapted across southern Nevada and (2) help local growers establish fields of Alkali sacaton, thereby decreasing the financial risk involved for first-time native seed producers, and ensuring the availability of locally adapted seed for years to come.

Goal 1 : To produce a genetically diverse Alkali sacaton seed population adapted to the area spanning southern Nevada

Step 1: The geographic region for seed adaptation was selected by BLM- Las Vegas Field Office, and in 2002 seed collections were made from four primary locations within a 50 mile radius in southern Nevada.

Unique and diminishing riparian habitats threaten over 23 federally listed species and numerous sensitive and priority status species in this region.

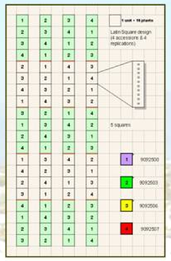


Alkali sacaton growing at Pahranagat NWR (above) and Ash Meadows NWR

Step 2: The four ecotypes were planted as plugs into replicated latin square arrangement at the Tucson Plant Materials Center, to maximize hybridization and to evaluate genetic variation between ecotypes.

Data were collected on vegetative traits (height, weight, diameter, #inflorescence) and reproductive schedules (flowering & seed maturity). Statistically significant differences observed suggest that large variation can exist within species – even within small geographic regions such as southern Nevada.

Plugs were planted into replicated latin squares at the Tucson PMC (right); The four ecotypes were evaluated by measuring individual grasses (below); examples from Lake Mead and Ash Meadows (below right)



Step 3: Population of Alkali sacaton developed at the Tucson PMC was released as Vegas germplasm by NRCS and BLM in 2006. This seed is currently available for commercial production.

Seed harvest, October 2005

Cleaning seed (above) for the final product

Goal 2: To establish local southern Nevada growers with Vegas germplasm Alkali sacaton fields, for long term seed availability and restoration

Step 1: High Desert Resource Conservation & Development (RC&D) found two local growers interested in commercial production of native grass seed. In August 2006, Vegas germplasm Alkali sacaton seed were sewn into plugs at the Tucson PMC, and 8 weeks later transported to southern Nevada for planting.

Plugs ready for transport to Nevada (above); project partners from BLM-Las Vegas Field Office, High Desert RC&D and Tucson PMC convene at Moapa planting

Step 2: Fields were established in cooperation with 2 first time native seed growers in September 2006: Pahrump (near Ash Meadows NWR) and Moapa Valley (near Moapa NWR). Seed from these producers will allow BLM and the Southern Nevada Restoration Team to restore their riparian areas.

Planting at a local farm in Pahrump (above right); Helping Moapa School plant their fields (above and left)

Step 3 (future): Compare the Alkali sacaton seed produced at the Tucson PMC in Arizona with the seed grown by local seed producers in Nevada, to determine if location of production affects the adaptability of this species. Common gardens will be used to compare parents and successive generations produced at all centers of production as well as field plantings in rangeland settings.