United States Department of Agriculture

NRCS Natural Resources Conservation Service

Plant Materials Program

Tucson Plant Materials Center
Year 2002
Progress Report of Activities

3241 North Romero Road, Tucson, AZ 85705 Tel: 520-292-2999 FAX: 520-292-9099
Web Site: Plant-Materials.nrcs.usda.gov

Who We Are

The Tucson Plant Materials Center (PMC) is a division of the United States Department of Agriculture's Natural Resources Conservation Service (NRCS). It is part of a network of 26 Plant Materials Centers located throughout the United States to develop and evaluate native plants. Operations began at the Tucson PMC in 1935. The Center was officially listed on the National Register of Historic Places in 1997; it is the first PMC to be so recognized. The Tucson PMC serves areas located in the Sonoran, Mohave, and parts of the Chihuahuan deserts located in Arizona, southeastern California, southern Nevada, southern Utah, and southwestern New Mexico. The Tucson PMC is located in northwest Tucson, just east of Interstate 10, on Romero Road just south of Prince Road.

What We Do

The evaluation of native plants as well as cultural and management practices are carried out at the federally owned 45-acre farm. Conservation plant material and practices are also evaluated throughout the PMC service area. The mission of the Tucson PMC is to provide quality vegetative solutions to conservation problems. The Tucson PMC conducts various studies and plantings and participates in various cooperative efforts to address an array of resource issues in the following areas:

1. Rangeland
2. Mined Land
3. Urban Lands
4. Cropland
5. Riparian Areas

The Tucson PMC actively provides technical assistance to NRCS Field Offices, Resource Conservation and Development (RC&D) groups, Conservation districts, federal and state agencies, and private landowners. This interagency cooperation offers many opportunities for joint development and release of plant materials as well as for exchange of information, seed, and planting stock.

A brief summary of year 2002 accomplishments follows. To receive more detailed information on specific projects request a copy of the 2002 Annual Technical Report from the address or website listed above.

Cane Bluestem Released for Commercial Production

Cane bluestem (*Bothriochloa barbinodis*) is a native, perennial bunchgrass that contributes fair to good range forage in the Southwest. This species can be found in the oak woodland, chaparral, and semidesert grassland vegetation types in Arizona and northern Mexico at elevations between 305 and 1,830 m. Saltillo origin was selected for release in 2001 because of its overall vigor, seed production, and biomass production. Cane bluestem provides good wildlife forage for pronghorn antelope and cover for Gambel's quail, dove, and rabbits as well as other small rodents. The Tucson PMC recommends that Saltillo origin be utilized as part of a seeding

mixture comprising approximately 15-30% of the total seed mix; however the percent composition may vary depending on the seeding objective. Cane bluestem has characteristics that allow it to tolerate severe climatic conditions and/or heavy use. Cane bluestem is found primarily on dry, sandy, gravelly or rocky sites. It is best adapted to sandy loam to calcareous loam soils.

Desert Saltbush Released for Commercial Production

Blythe germplasm desert saltbush (*Atriplex polycarpa*) is a native, perennial, low-growing shrub found on alkaline plains and occasionally on rocky or gravelly slopes at elevations between 120 – 900 meters. Blythe germplasm was selected for release in 2001 for its superior seed production and uniform growth habit. This release will be primarily used as an erosion control plant on degraded rangelands and critical areas such as abandoned cropland and road cuts. The range of adaptation for Blythe germplasm is primarily the Sonoran and Mohave deserts at elevations between 90 and 915 meters with annual precipitation from 75 to 250 mm. Desert saltbush provides cover for Gambel's quail and dove as well as browse for mule deer and rabbits. Potential soils include sandy loam, loam and clay loam, as well as moderately saline soils.

Spike Dropseed ready for Field Planting Trials

Spike dropseed (*Sporobolus contractus*) is a native warm season bunch grass that is commonly found on dry, sandy or gravelly soils in southeastern Arizona to Colorado, Texas, southeastern California, and Sonora, Mexico. This population is comprised of 44 collections from southeastern Arizona and is our first effort using the Convergent Divergent Plant Improvement Strategy or **CDI**. This strategy involves bringing a large collection of plants to one common point (PMC farm). Planting equal number of plants in a crossing block or production field, CONVERGENCE. Collecting equal quantities of seed from each plant and propagating plants from each collection and taking them out to different environments to allow a natural selection for the best adapted plants, DIVERGENCE. In our senerio we planted at three sites in southern Arizona representing low, medium, and high rainfall and similar levels of Lehmann's lovegrass competition. After one year we went back to those three sites and collected seed from selected individuals. This seed was then used to develop a breeders seed field. The objective of this project is to develop a genetically diverse population of spike dropseed that can be used as a native replacement for Lehmann's lovegrass. Upcoming field trials will provide information on the usefulness of CDI and whether this process can produce a successful product.

Cooperative Efforts for Managing Noxious Weeds Yield Positive Results

Efforts to evaluate the control and management of noxious weeds are being cooperatively addressed by the Tucson PMC, University of Arizona Cooperative Extension, the Tonto Weed Management Group, and the Arizona Department of Transportation (ADOT). This cooperative effort is currently focusing primarily on yellow starthistle (*Centaurea solstitialis*) infestations along with a number of other noxious weed species such as Scotch thistle (*Onopordum acanthium*), spotted knapweed (*Centaurea maculosa*), and Dalmatian toadflax (*Linaria genistifolia* spp. *dalmatica*).

Yellow Starthistle

Yellow is a winter annual that spreads exclusively by seed however, it can regrow from a deep taproot. In Arizona, yellow starthistle is thought to be capable of germination whenever moisture is adequate and temperatures average 20 to 25 °C. Seed production varies but one plant is capable of producing 150,000 seed up to 95% of, which are viable.

In the spring of 2000 a yellow starthistle project evaluating various suppression methods was cooperatively established in a heavily infested

pasture located in Young, Arizona. Five suppression treatments are being studied along with the establishment of two native warm-season and two native cool-season grass species to act as suppressors to compete with the yellow starthistle. Cool-season grasses may directly compete with yellow starthistle seedlings during spring and fall after germination. The warm-season grasses may indirectly compete with yellow starthistle before it germinates by removing soil moisture and nutrients during the summer rain period in Arizona. The baseline data will help to determine the level of success of the various suppression treatments.

This project was finalized in 2002 with poor results from the applied treatments. Seeding trials were considered unsuccessful due to the continuing drought. The herbicide trials had poor results due to the thick thatch layer of the yellow starthistle.

Sweet Resin Bush

The Tucson PMC has a long history of participation with the Santa Rita Experimental Range (SRER) with the University of Arizona and other cooperating agencies. In 1997 the NRCS completed a revision of a soil and range survey on the entire SRER. During the course of this survey a small infestation of Sweet Resin Bush (*Euryops subcarnosus*) was discovered in the southwest corner of the SRER. The NRCS mapped the extent of the infestation in April 2000.

Sweet Resin Bush was introduced into several areas in Arizona in the 1930's by the Soil Conservation Service and planted by the Civilian Conservation Corps. It has proven to be a highly invasive and noxious plant. In 1998 it was added to the State of Arizona's Noxious Weed List.

An interagency task group (Sweet Resinbush and Karoo Bush Weed Management Group) was formed in southern Arizona to control this shrub. There are nine known populations of this noxious weed. One large (3,000 acres) population is located near Safford, Arizona and eight smaller populations are located at various locations in southeastern Arizona. An AmeriCorps National Civilian Community Corps crew was requested in 1998 to assist NRCS, the University of Arizona, Arizona State Land Department, and the U.S. Fish and Wildlife Service in the initial attack on this plant. In February 1999 an AmeriCorps crew was assigned for 2 weeks to the project. They were able to remove approximately 5 acres of an extremely dense area of sweet resin bush – the center of origin for the site. During the remainder of 1999 and 2000 smaller scale control activities were initiated utilizing local troops from the Boy Scouts of America. In the spring of 2001 another AmeriCorp crew was assigned to the project for a period of 2 weeks. Their efforts were focused on scouting the area and removing plants in identified sites. As a result of these efforts the population of sweet resin bush at the SRER appears to be under control. Follow-up efforts are needed over the next 5 years to scout the area for new populations and any individuals that were missed during the 2001control effort.

Irrigated Pasture Management Workshops

In May 2000 the Tucson PMC participated in two irrigated pasture management workshops in Santa Cruz County, Arizona. Proper species selection, pasture and irrigation water management is extremely important when developing and maintaining a viable, productive irrigated pasture in an arid environment. Irrigated pasture provides forage for livestock, is beneficial during breeding and calving periods, serves as an exercise area for horses, and most importantly serves to protect soil and reduce offsite sediment deposition.

The Tucson PMC has been working with the Tucson and Willcox Field Offices and the University of Arizona Cooperative Extension Service to identify additional plant species for use in irrigated pastures as well as promote proper irrigated pasture management through educational workshops for landowners and NRCS employees. A cooperative project with the Santa Cruz County Cooperative Extension Service, a local landowner, and the Tucson PMC was initiated in August 2000

to evaluate seven warm-season grass species for their potential use in irrigated pasture systems in southeastern Arizona.

The Tucson PMC conducted an Irrigated Pasture Tour in 2002. Highlights included discussion of the various efforts underway in southern Arizona involving species/variety trials and results obtained from these trials. Trials at the Tucson PMC include both introduced and native grasses. Although native grass such as sideoats grama are slower to establish than bermuda grass, sideoats grama was the best forage producer in 2002 with no supplemental fertilization. In 2003 the trial will expand to include fertilization and additional native grasses.

To learn more about these and other PMC activities visit our website at:

Plant-Materials.nrcs.usda.gov

Tucson PMC Staff:

Bruce Munda
Plant Resource Specialist

Ramona Garner
Research and Operations Coordinator

Fatima Muhammed
Intern

Harry Buck
Biological Science Technician