

## Tucson Plant Materials Center Year 2009 Progress Report of Activities

This is a summary to highlight some of the past year's activities at the Tucson Plant Materials Center.

### *Studies*

#### **Cover Crops for More Sustainable Agriculture**



Sunn Hemp plants reach 8-9 ft tall at the Tucson PMC

In an effort to search for crops that may reduce fertilizer costs for producers, the Plant Materials Program initiated an inter-center study to determine the potential of Sunn Hemp (*Crotalaria juncea*) as a green manure crop. Sunn Hemp is a leguminous plant and as such, can fix nitrogen from the air. The plants can produce up to 145 pounds of nitrogen per acre in a 60-90 day growing season.

The release 'Tropic Sun' from the Hoolehua Plant Materials Center in Molokai, Hawaii, was planted at 25 Plant Materials Centers throughout the U.S. at a rate of 50 lbs. per acre. At the Tucson Plant Materials Center (TPMC), the study was planted May 19, 2009. Sunn Hemp exhibited excellent germination. However, the crop had unexpected guests, ground squirrels. The ground squirrels ate well over a third of the newly germinated seedlings in one weekend. Despite the damage caused by the ground squirrels, part of the crop was salvaged and data was collected.

Sunn Hemp had a dry bio-mass yield totaling 11 tons per acre. The planting produced about 4 tons of dry-biomass per acre at each cutting (30 day intervals) during the 90 day growing season. A total of 6 samples were sent to the East Texas Plant Materials Center for percent nitrogen analysis. Preliminary results indicate that Sunn Hemp has potential as a cover crop in areas with growing conditions similar to those found in Tucson, Arizona.

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## Sideoats Grama: Southeast Arizona Collections

Since 2006 the TPMC has been working to develop a Sideoats grama (*Bouteloua curtipendula*) release for Southeast Arizona Major Land Resource Area 41. Sideoats grama is a primary component of the plant community in this region and is in high demand for revegetation mixes. However, the current commercially available releases of Sideoats grama have not persisted through the severe droughts that are common to the region. Previous germination testing of the 31 accessions in the TPMC field has indicated poor seed production. To explore potential causes for the poor production, two separate studies were initiated.

One of the studies concerns the varieties of sideoats. Three different varieties of sideoats exist and can be distinguished by different growth characteristics and seed production. This year, an evaluation of several growth characteristics was completed to help determine whether different varieties may be represented in our field. In addition, after conferring with personnel from the University of Arizona, the PMC began to collect preliminary data on the tiller moisture content of representative plants to track water availability. In previous years, the field had been irrigated approximately every 5 weeks during the growing season. This year, in order to more closely mimic the environment of the parent plants, the field planting was to be irrigated only when average tiller moisture content reached ~30%. Tiller moisture measurements never fell below 40%, although significant drought stress was apparent in some accessions. A single irrigation was conducted in early August to prevent mortality of these accessions.

Seed was harvested from all 31 accessions last fall and germination tests will be conducted to determine whether decreasing the water frequency has influenced the viability of seed. If so, we plan to select seed from those accessions with the best seed production to create a new planting block. We expect (and hope) this new planting will be a source of viable seed for planting *and persisting* in southern Arizona.



Sideoats grama: shortly before irrigation



Less than a month after the irrigation

## Intercenter Trials: Cottontop and Alkali sacaton

In early May, two intercenter trials were begun at the TPMC. Three releases of Arizona cottontop (*Digitaria californica*) are being evaluated in a joint study with the Knox City PMC. Five other PMCs across the country are scheduled to participate in the evaluation of four releases of Alkali sacaton (*Sporobolus airoides*) in conjunction with the Tucson PMC. Intercenter trials are designed to refine and strengthen our understanding of these plants' performance over broad geographic areas and further improve our recommendations to conservation practitioners. Data such as dates of flowering, dates of maturity, and dates of dormancy occurrence will be collected from both trials and compiled with the data collected at participating PMCs.



Bruce Munda, Arizona Plant Materials Specialist, assisted in planting each intercenter trial

## Technology Development and Transfer

### Conservation Planning meets Plant Materials Training

The TPMC hosted the Arizona State Conservation Planning course on April 13-24<sup>th</sup>, 2009. Fourteen new NRCS employees attended the course. Participants toured the TPMC during the cropland section of the course. Plant Materials staff provided training on seed collection, field plantings, and our mission.



Course participants evaluate TPMC fields

## Native Grass Production with the Tohono O’odham Farming Authority

In October 2008, representatives of the Tohono O’odham farming authority visited and toured the PMC to discuss the production of native grasses. During the meeting, foundation seed of Whiplash pappusgrass (*Pappophorum vaginatum*) – known locally as Pima pappusgrass - was provided to the farm supervisor to set up a field trial. In April 2009, Bruce Munda, Arizona Plant Materials Specialist, visited the San Lucy farm and provided foundation seed of ‘Loetta’ Arizona cottontop (*Digitaria californica*) and technical assistance to the farm supervisor. In September 2009, the Tohono O’odham farming authority initiated a five acre planting of both species on the farm. PMC staff members were on-site during the planting to provide technical assistance. We look forward to having a local supplier of these two PMC releases, particularly Pima pappusgrass, which is not commercially available.



TPMC personnel work with Tohono O’odham personnel to ensure proper planting rates

## Marketing the Plant Materials Program



Tucson PMC staff Heather Dial and Erin Boyd

The Tucson PMC presented the National Plant Materials Exhibit at the annual convention of the Arizona Cattle Growers’ Association (ACGA). ACGA is a professional organization solely dedicated to representing, educating, communicating, and providing services to Arizona’s beef producing families. The event took place on July 29-31, 2009 at Lowes Ventana Canyon Resort in Tucson. Our participation is part of ongoing outreach activities to promote awareness of Natural Resources Conservation Services (NRCS) and Plant Materials programs. Arizona-NRCS Public affairs specialists along with TPMC staff were available at the booth to answer questions and provide information. About 15 different exhibitors were present at the event and more than 200 people attended the convention.

### We Are On The Web!!

[Http://Plant-Materials.nrcs.usda.gov](http://Plant-Materials.nrcs.usda.gov)

Check out our new Technical Publication: Salvage Techniques for Saguaro Cacti, Barrel Cacti, and Ocotillo

## Native Seeds Project: Phase Two in California

The second phase of a project with the BLM-Las Vegas Office has moved from the Nevada Mojave to the California Mojave. This was done with the expectation that interested, qualified growers for a 2-year pilot project would be plentiful in the California Mojave. For the first phase of the project, two riparian grasses were released cooperatively by the TPMC and the BLM in 2006 and 2007: Vegas germplasm Alkali sacaton (*Sporobolus airoides*) and Moapa germplasm Scratchgrass (*Muhlenbergia asperifolia*). The second phase of the project requires growers to produce sufficient seed of these species for restoration projects in Nevada. The Tucson PMC and High Desert RC&D (in Nevada), in collaboration with Desert Mountain RC&D (in California) and the three NRCS field offices working in this region, Lancaster (CA), Victorville (CA) and Kingman (AZ), put the word out to locate experienced farmers. Those interested will be funded to establish small acreages of one or both of these species.



Project partners visit Antelope Valley Nursery, near Lancaster, CA, a potential grower in the future.

Although these species are native to this region and require lower rates of water and other inputs, few farmers with the necessary levels of equipment, experience and interest have signed onto the project. According to veteran District Conservationist Rick Aguayo of the Victorville Field Office, who presented the project to a list of producers in his area he thought fit the project, the problem may have to do with logistics. He wonders if “niche” farmers with small acreages do not have the water rights to take on such a project. On the other hand, larger land holders may not have the time to experiment with small acreages of an unknown crop. Perhaps in this current economic environment, even a good deal may be too big a risk. This year we will continue to promote the project with local presentations and field visits, with hopes of finding the right producers up to the task.

## Earth Day in Tucson



TPMC personnel attended and set up an informational booth during the 15<sup>th</sup> Annual Tucson Earth Day Festival in Reid Park. Visitors to the booth were given the opportunity to plant their very own native wildflower, desert marigold (*Baileya multiradiata*), and were provided information on its care. Visitors also received information on the TPMC mission and work.



### ***The Tucson PMC: Who We Are***

In 1934, the first USDA Plant Materials Center was established in Tucson, Arizona. The center was created to address the need for adapted plant material to revegetate eroded rangelands in the American southwest. Today, erosion continues to threaten western rangelands in addition to other resource concerns including: drought, fire, invasive species, and wildland-urban interface issues. As one of 27 Plant Materials Centers across the United States, the Tucson PMC continues to address these conservation issues within its service area, which encompasses areas within the Sonoran, Mojave, and Chihuahuan Desert regions.



The Tucson PMC continues to work out of the original adobe buildings built in the 1930s

### ***... And what we do***

The goal of the Tucson PMC is to provide effective, economical vegetative solutions for conservation problems. The conservation potential of native grasses, shrubs, forbs and trees is evaluated at the federally owned 45-acre farm in addition to test locations throughout the service area. Plant materials become part of advanced trials designed to develop cultural and management practices that enhance seed production under agronomic conditions. The ease of establishment and persistence of plant materials in their native plant communities is also evaluated.

The Tucson PMC conducts studies and plantings to address resource issues in the following areas:

- Rangelands
- Mined lands
- Urban and urban-interface areas
- Croplands
- Riparian areas

The Tucson PMC works in partnership with NRCS field offices, resource conservation and development (RC&D) groups, conservation districts, federal and state agencies, non-profit groups and private landowners. Cooperation with agencies other than the NRCS provides opportunities for the joint development of plant materials and management practices as well as for exchange of information, seed, and planting stock.

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