

Year 2007

Issued June 2008 **Progress Report of Activities**  
**Los Lunas Plant Materials Center**

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### Who We Are

The Los Lunas Plant Materials Center is one of 28 Plant Materials Centers operated by the USDA Natural Resources Conservation Service (NRCS). Areas served by the LLPMC include New Mexico, Northeast Arizona, Southeast Colorado, West Texas, and Southeast Utah. The LLPMC is located twenty-five miles south of Albuquerque in Los Lunas, New Mexico. It is operated in conjunction with New Mexico State University's Agricultural Science Center. The facility is located in the Middle Rio Grande Valley and includes 200+ acres of irrigated land.



**Los Lunas Plant Materials Center at Los Lunas, New Mexico**

### What We Do

It is our mission to develop, test and transfer effective, state-of-the-art plant science technology to meet customer and resource needs. The LLPMC targets these major land resource areas (ecozones):

- New Mexico and Arizona mountains
- San Juan River Valley plateaus and mesas
- Southern desert basin, plains and mountains
- Southern Rocky Mountains
- High intermountain valleys
- Pecos–Canadian plains and valleys

The LLPMC emphasizes using native plant materials to solve conservation problems. Environmental conditions including low precipitation, high intensity rainfall, wind, topography, and varied land uses combine to produce a variety of problems needing plant material solutions.

The LLPMC collects native species for testing, selecting, and distribution to commercial growers along with the development of seed and plant production technology. Additionally, plant establishment technologies are developed or refined that require minimal or no irrigation in the arid southwest.

The following highlights are featured in this report:

- Publications from the LLPMC
- Plant Production for Riparian and Revegetation Projects
- Developing Planting Technologies
- Conservation Concerns
- National Park Assistance
- Plant Materials Distribution for 2007

The articles on the following pages provide a brief summary of Year 2007 accomplishments. For more detailed technical information, request the *2007 Annual Technical Report*.

## Publications Available from the LLPMC

The Los Lunas Plant Materials Center has developed the following publications about planting technologies developed at the LLPMC:

- *Guidelines for Planning Riparian Restoration in the Southwest*
- *Guidelines for Planting Dormant Whip Cuttings to Revegetate and Stabilize Streambanks*
- *Guidelines for Planting Longstem Transplants for Riparian Restoration in the Southwest*
- *The Pole Cutting Solution*

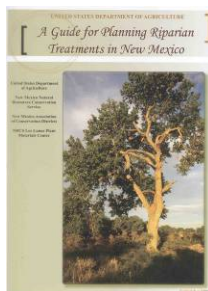
These publications are available on the LLPMC website, and in addition, our annual reports, release information, fact sheets, published proceedings, and other informational documents also are available.

Download these documents from the following website:

<http://www.nm.nrcs.usda.gov/programs/pmc/publications.html>

## New Riparian Publication from the LLPMC and the NRCS New Mexico Technical Staff

A new publication titled *A Guide for Planning Riparian Treatments in New Mexico* was developed for conservationists who will be providing both planning and design assistance in treating riparian areas in the southwest. Land managers have been engaged in controlling exotic phreatophytic, woody vegetation in riparian areas; they have treated more than 34,000 acres in New Mexico in 2002, 2003, and 2004. These areas have undergone either passive or active revegetation treatments. The methodologies utilized have been developed mainly by New Mexico universities, federal and state agencies, or experts within private industries. The USDA-NRCS Los Lunas Plant Materials Center (LLPMC) has been a major contributor in developing new, innovative planting methodologies and new riparian plant materials that work without follow-up irrigation in the arid southwest. Common restoration methodologies quite often are not effective under southwest conditions, and therefore may not be successful in New Mexico.



The guide identifies the importance of collecting critical on-site information necessary for the evaluation of site conditions which are based on hydrology, soils, and vegetation. The conditions of the site help to identify the treatment options for restoration, such as controlling invasive woody species or planting vegetation. All treatments include some type of maintenance and monitoring.

A few treatment scenarios are provided in the guide, and examples are given as well as before and after photographs of sites that have received treatments. The 40-page guide identifies 40 websites where New Mexico NRCS-endorsed treatment information can be downloaded. This guide is free of charge on the NRCS New Mexico website <http://www.nm.nrcs.usda.gov/technical/tech-notes/bio/riparian.pdf>.

A summary on the attributes of the guide will be presented at the 2008 National Soil and Water Conservation Meeting in Tucson, Arizona.

## Production of Riparian Plant Materials for Watershed and Ecosystem Restoration Projects

The purpose of this project is to establish a plant materials source for native riparian trees and shrubs at the LLPMC for the Cibola National Forest. These plant materials are ecotypes indigenous to areas undergoing watershed and ecosystem restoration within the Cibola National Forest, including the Canadian River Salt Cedar Eradication Project (Kiowa National Grasslands) and the Tajique Watershed Restoration Project.

The LLPMC is producing containerized plant materials of tree, shrub and wetland species from seed collected by US Forest Service personnel. Some of the seedlings that have been produced have been installed in pole production blocks to provide a long-term source of dormant pole cuttings.



Mills Canyon coyote willow, cottonwood, and peachleaf willow (left to right) in one-gallon tree pots propagated from seed in 2005 (photo taken August 28, 2007). The largest plants have stem lengths of 5- to 6-feet.

The following table shows the production inventory of riparian species at the LLPMC.

**Riparian Trees and Shrubs for Kiowa National Grasslands Mills Canyon Restoration Project as of Summer 2007**

Species	Propagation Method	One-Gallon Treepots
Plains cottonwood	seed	750
Narrowleaf (coyote) willow	seed and cuttings	350
Peachleaf willow	seed and cuttings	130
Chokecherry	seed	700
<b>Total</b>		<b>1930</b>





Block of Mills Canyon chokecherry in one-gallon tree pots propagated from seed in 2005 and transplanted in 2007.  
Photo taken August 28, 2007.

### Longstem Transplants – Technology for Establishing Woody Vegetation

In the riparian areas of the southwest desert region, the establishment of obligate riparian woody shrubs and trees other than the willow family (that is phreatophytic species) requires either lengthy irrigation until the transplant's root system can extend into permanent soil moisture above the water table (capillary fringe), or planting techniques that allow root systems immediate contact with this wet zone. Plants of these species can be grown in any size container but the mainstem is allowed to grow four-to-ten times the length of the rootball. We call these plants longstem transplants.

These longstem transplants are placed in deep holes where the root system is placed in the capillary fringe of the water table in riparian (bosque) areas. The root crown of these plants may be buried up to a 4- to 6-foot depth. These plants show no negative response from this treatment. In fact, they bolt in the spring with new growth maybe because they have complete access to groundwater. This planting method has been successful for all species planted so far and includes: New Mexico olive (*Forestiera pubescens*), false indigo, (*Amorpha fruticosa*), false willow (*Baccharis salicina*), skunkbush sumac (*Rhus trilobata*), golden currant (*Ribes aureum*), wolfberry (*Lycium torreyi*) screwbean mesquite (*Prosopis pubescens*), netleaf hackberry (*Celtis reticulata*), and box elder (*Acer negundo*). We have planted over 10,000 in the past five years with an average survival rate of 85%; most of these plantings never received any follow-up irrigation treatments.

To provide hands-on training for this planting technique, the Los Lunas Plant Materials Center hosted five workshops in 2007. These workshops were held on the local riparian areas in Belen, Las Vegas, Carlsbad, Cuba, and Rio Rancho, New Mexico. Workshop participants also received training on planting cottonwood pole cuttings, willow whips, and tallpots; they also learned to construct poultry wire tree-guards.



Placing the rootball at a 5-foot depth in order to come in contact with the capillary water.



Same location in June of the third growing season. Plants have not been irrigated even though they have been planted in an 8-inch precipitation zone.

### Development of Legume *Dalea* for Use in Burn Rehab Seed Mixtures in Southwestern Piñon/Juniper Communities

The purpose of this project is to determine seed production feasibility of different species of *Dalea* that establish naturally after burns. These species would be used as burn rehab species in the piñon/juniper vegetation type areas in the Southwest and have a potential for commercial seed production.

The LLPMC is evaluating the candidate species for the Gila National Forest for agronomic characteristics that would make them promising for commercial-scale production, and is producing sufficient quantities of seed for testing as a component in burn rehab seed mixtures. The palatability and forage value of the species also will be assessed to determine their potential use for wildlife habitats.

The goal is to develop legume releases that will be requested by land managers and can be produced economically by commercial growers. The two species currently being tested are *Dalea albiflora* and *Dalea leporina*.





*Dalea albiflora* seedlings on August 22, 2007 just prior to field planting.

A quarter-acre production field of the annual *Dalea leporina* was installed in April 2007 and harvested in November 2007. A one-eighth-acre field of the perennial *Dalea albiflora* was installed in the August 2007 using 10-cubic-inch seedling plugs.



*Dalea leporina* seed production field (approximately one-quarter-acre) on August 22, 2007. Note shovel handle for scale.

### Seed Production and Source-Identified Germplasm Release of Upland Grass Species from the Apache-Sitgreaves National Forests

The purpose of this project is to develop new, native plant materials for use in Southwestern site restoration and rehabilitation; especially following wildfire, prescribed fire, and watershed restoration. Grass seed sources are being developed from wildland collections ranging in elevation from 6,100 to 10,500 feet and representing piñon/juniper woodland, ponderosa pine forest, and mixed conifer forest types. The intent is for the LLPMC to develop source-identified, germplasm releases that will be made available to commercial seed growers in the Southwest. The goal is to eventually produce a sufficient amount of seed for large-scale rehabilitation and restoration projects.



Arizona fescue (left with white labels) and Thurber fescue (right with blue labels) plug seedlings in greenhouse. Photo taken on August 28, 2007.



Arizona fescue (Greens Peak) seed production Field 33N. Seedlings planted on September 10, 2007. Photo taken on September 13, 2007.

The following table shows the species and amount of production at the LLPMC.

Species and Acreage Installed in 2007 of Apache-Sitgreaves National Forest Grasses

Common Name	Genus	Species	Collection Elev.	Seed Production Installed in 2007 (acres)
Blue grama	<i>Bouteloua</i>	<i>gracilis</i>	6,100	0.09
Blue grama	<i>Bouteloua</i>	<i>gracilis</i>	6,700	0.09
Blue grama	<i>Bouteloua</i>	<i>gracilis</i>	6,400	0.09
Mountain brome	<i>Bromus</i>	<i>marginatus</i>	9,500	0.18
Thurber's fescue	<i>Festuca</i>	<i>thurberi</i>	10,480	0.07
Arizona fescue	<i>Festuca</i>	<i>arizonica</i>	9,500	0.16
Bristly wolfstail	<i>Lycurus</i>	<i>setosus</i>	6,400	0.28

**Species and Acreage Installed in 2007 of Apache-Sitgreaves National Forest Grasses**

Common Name	Genus	Species	Collection Elev.	Seed Production Installed in 2007 (acres)
Spike muhly	<i>Muhlenbergia</i>	<i>wrightii</i>	7,100	0.24
Mountain muhly	<i>Muhlenbergia</i>	<i>montana</i>	8,100	0.19
James' galleta	<i>Pleuraphis</i>	<i>jamesii</i>	6,100	0.03

**Cultivar Development Update**

***Giant Sacaton (Sporobolus wrightii)***

Giant sacaton is a warm-season, perennial bunchgrass that is commonly found above shallow groundwater in arroyos or stream banks where, because of its pheatophytic nature, it can grow to heights of more than 6 feet in the deserts of the southwest. In the spring, the young grass is highly palatable to livestock and wildlife.

The LLPMC has been unsuccessful in its attempt to create a larger giant sacaton plant through hybrid crossing. Our replicated, hybrid-cross planting did not produce progeny that were significantly larger than the original parent plants. The ten selected, superior-appearing accessions were compared to their f-1 progeny in an eight replicated planting. In the summer of 2007, this planting was evaluated for the third time. Although the mature plants were able to obtain a height a more than 8-feet in a single growing season, the LLPMC is canceling the hybrid vigor effort. These plants were able to attain this height only when they had become established and were provided ideal growing conditions.

In preparation for a plant material release in 2010, the LLPMC will establish a giant sacaton seed production field composed of a blend of the ten superior plants.



**Giant sacaton field at the LLPMC.**

***Tobosa Grass (Pleuraphis mutica) and Little Bluestem (Schizachyrium scoparium)***

Tobosa grass is a warm-season, perennial sodgrass tolerant to an 8-inch precipitation zone, and it is highly palatable to livestock and wildlife in the green, growing stage. Little bluestem is a warm-season, perennial bunchgrass that is tolerant to a 10-inch precipitation zone. Palatability to livestock and wildlife is moderate-to-low while in the green, growing stage.

After 15 years of evaluation, five superior performing accessions in forage production have been selected from the original 35 accessions of tobosa grass and 110 accessions of little bluestem. The selected accessions were vegetatively cloned and planted into a poly-cross breeding block at the LLPMC. This breeding block will produce seed for field testing for NRCS field offices that may be interested in either or both species.

A cultivar or variety of tobosa grass has not been developed; consequently it is difficult to find commercially. The little bluestem selections produced significantly more forage than ‘Pastura’ little bluestem which is currently the reclamation standard for seeding in the southwest.



**Tobosa grass poly-cross breeding field at the LLPMC.**



**Little bluestem poly-cross breeding field at the LLPMC.**



### ***Mesa dropseed (Sporobolus flexuosus)***

Mesa dropseed is a warm-season, perennial bunchgrass that tolerates an 8-inch annual precipitation zone. It is commonly found on dry, sandy soils in New Mexico. A new, replicated initial evaluation planting of mesa dropseed has been established on one-eighth acre at the LLPMC. It is composed of 18 accessions, many of which were collected by New Mexico NRCS field office staff. This planting will be evaluated for both seed and forage production for the next five years and seed will be harvested annually which will be available for testing to NRCS field offices. A cultivar or variety of mesa dropseed has not been developed making it difficult to find commercially.



Mesa dropseed field planting at the LLPMC.

### **Assistance–Conservation Concerns**

The LLPMC has been working directly with USDA-NRCS Field Offices, Resource Conservation and Development Offices, and Soil and Water Conservation Districts to provide assistance with many conservation concerns including wind erosion. Solutions to wind erosion have included field windstrips, variety trials, and revegetation techniques. By providing assistance to these organizations, it gives the LLPMC opportunities to test new plant materials and demonstrate new planting techniques.

The LLPMC continues to provide giant sacaton transplants for trial plantings throughout the LLPMC service area. These trial plantings help to evaluate the effectiveness of giant sacaton as field and farmstead windstrips that aid in the prevention of wind erosion and determine the range of adaptation. The first of the trial windstrip plantings was established in 1999 in Columbus, New Mexico.

Since 1999, thirteen locations including the Columbus site have seen giant sacaton windstrip trials established. These include trials located in or near Jal, Milan, Deming, Espanola, Estancia, Tucumcari, Los Lunas, Lovington, and Tatum, New Mexico. We also installed a trial planting at The Gap, Arizona.

#### *City of Hobbs Landfill Site*

A non-operating landfill site in Hobbs, New Mexico was selected to test a giant sacaton erosion-control planting. The

objective is to help prevent soil erosion on the slopes of the landfill following rainfall events.

The landfill site had been previously rehabilitated by its owner Waste Management, Inc by installing a grass-seed mix into the existing, vegetative mulch. In July 2007, Waste Management employees, NRCS personnel, and volunteers hand-planted approximately 1,100 giant sacaton transplants along the slope of the landfill. These transplants were started and grown at the LLPMC.



Volunteers planting Giant sacaton transplants at the Hobbs, New Mexico landfill site.



Giant sacaton erosion control planting at the Hobbs, New Mexico landfill site as of September 2007. Waddles were previously installed to help against water erosion.

### **National Park Service Assistance**

The LLPMC has agreements with Carlsbad Caverns National Park, Capulin Volcano National Monument, Grand Canyon National Park, Wupatki National Monument, Pipe Spring National Monument, and Zion National Park of the Department of the Interior’s National Park Service (NPS). These agreements allow the LLPMC to assist the NPS to revegetate disturbed areas in the parks, such as roadsides, trails, campgrounds, and other construction areas. The LLPMC provides the NPS with plant materials of the parks’ local native ecotypes by producing both seed and containerized transplants for revegetation purposes.

As of the date of this report, the LLPMC has in production 15 native grass species on a total of 14.45 acres. In 2007, the



LLPMC produced 253 pounds of grass seed to be used for NPS revegetation efforts.



Carlsbad Cavern National Park Bristlegrass



Zion National Park Sand bluestem

### Partnering with the New Mexico Department of Transportation to Improve Dry-Land Seeding Technology

In 2005, a cooperative agreement was developed between the New Mexico Department of Transportation (NMDOT) and the USDA-NRCS Los Lunas Plant Materials Center. The new agreement begins a three-year project between the two agencies to evaluate the revegetation technology currently being used by the NMDOT. The NMDOT has had difficulty meeting the national vegetation requirements following the completion of road construction projects. The proposed work in the 2005 agreement will study the current revegetation technology and determine its effectiveness.

A trial planting in Gallup, New Mexico (located on Highway 602) was evaluated in 2007 for percent establishment and forage production. Results of 2007 evaluation will be available in the *2007 NMDOT Progress Report* due out in April 2008.

A second trial planting was installed on a disturbed construction site near San Ysidro, New Mexico in 2007 (located on Highway 550).

Both sites will be monitored in 2008 for germination and forage production. The results from these evaluations and

the reports generated from this cooperative agreement will provide useful revegetation technology for both the NMDOT and the LLPMC.



San Ysidro, NM - Highway 550 NMDOT seeding trial. Spreading mulch on construction slopes.



Highway 550 NMDOT species seeding trial planting.



Highway 550 NMDOT grass-mix trial.



Gallup, NM – Highway 602 species seeding trial.

## Distribution of Plant Materials in 2007

Nineteen USDA-NRCS New Mexico Field Offices, three RC&D Offices, and twelve Plant Material Centers received plant materials as well as a number of federal and tribal agencies and non-profit organizations. In addition, plant materials were distributed to commercial producers of native seed and plants. Many of the plant materials distributed by the LLPMC have been used to revegetate cleared riparian areas. The following table lists the plant materials that were distributed by the LLPMC in 2007.

### 2007 Plant and Seed Distribution

<b>Distributed to:</b>	<b>Poles</b>	<b>Cuttings and whips</b>	<b>Large Containers 1-gallon &gt;</b>	<b>Small Containers &lt; 1-gal</b>	<b>PLS Seed (pounds)</b>
NRCS Field Offices (19) and RC&D's (3)	325	2,050	951	5,665	—
PMC's (12)	—	—	—	—	74
Seed Producers (3)	—	—	—	—	575
Nurseries (2)	—	300	—	162	0.6
Bureau of Reclamation	55	1,875	521	7	—
National Forests (3)	25	—	1,762	50	2.7
Agricultural Research Service	—	—	—	—	0.8
Bureau of Land Management (4)	420	85	229	—	—
Soil and Water Conservations Districts (9)	239	—	1,169	542	6.5
Native American Tribes (2)	300	—	824	95	—
US Fish & Wildlife Service	—	—	73	—	36
US Army Corp of Engineers	300	—	500	—	—
Non-Profit Organizations	1,025	3,000	410	50	1.5
<b>Total</b>					
	2,689	7,310	6,439	6,571	697