United States Department of Agriculture
Natural Resources Conservation Service

Lockeford Plant Materials Center

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Figure 1: Lockeford Plant Materials Center.

The Lockeford Plant Materials Center (CAPMC) is one of 27 centers nationally and serves the majority of California, which includes most of the coastal areas, the Central Valley and Sierras (MLRAs 4B, 5, 14, 15, 16, 17, 18, 19, 20, 21, 22A, 22B, and portions of 29, 30, and 31). The mission of the California Plant Materials Center is to develop technology and plant materials to address the resource concerns of California. We work with NRCS field offices, public agencies, universities, conservation organizations, tribes, and commercial seed producers and wholesale nurseries. The majority of our work focuses on species that are native to California.

Technology Development

ALMANAC Project

The CAPMC is one of several western PMCs in partnership with the USDA-ARS (Agricultural Research Service) to provide data to support development of the ALMANAC (Agricultural Land Management Alternative with Numerical Assessment Criteria) model. This model uses data describing western rangeland species to predict plant cover and forage production of plant functional groups under different climatic conditions and will be used for the rangeland CEAP (Conservation Effects Assessment Project). Saltgrass (*Distichlis spicata*), a rhizomatous grass, and alkali saccaton (*Sporobolus airoides*), a bunch grass, were the species used for data collection by PMC staff during 2011. Biomass production, nutrient content, leaf area and light interception measurements data was collected.

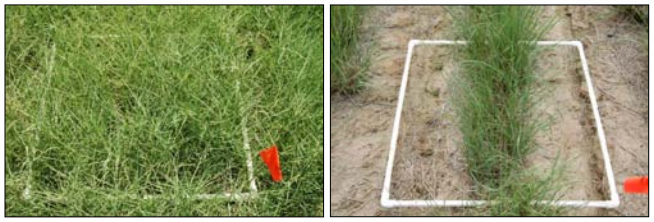

Figure 2: Plots of inland saltgrass, a rhizomatous grass, and Alkali saccaton, a bunch grass for ALMANAC project, May 2011.

Coyote brush (*Baccharis pilularis*) and woolypod vetch (*Vicia villosa*) were planted in preparation for measurements during 2012 and 2013.

Pollinator Plantings

Polinator hedgerows at the CAPMC planted in 2009 in collaboration with the Xerces Society were monitored throughout 2011 for plant cover and bloom periods.

Figure 3: Pollinator hedgerow in June 2011 with California phacelia and California poppy as the major floral components.

Bee and beneficial insect visitation was monitored by researchers from UC Davis. The researchers report that the bee populations at the CAPMC are more diverse than at their other monitoring sites.

This fall, CAPMC staff seeded a 'pollinator meadows' or 'bee pastures' demonstration site in collaboration with

Xerces and UC Davis researchers. This site consists of quarter acre plantings of four native pollinator mixtures to compare establishment and persistence at the site.

Alkali Sacaton ICST

An inter-center strain trial (ICST) of alkali sacaton (*Sporobolus airoides*) was established at the CAPMC in 2010. The trial consists of three releases: Vegas selected class germplasm from the Arizona PMC, 'Salado' from the New Mexico PMC, 'Saltalk' from the Knox City, Texas PMC, plus an experimental line (9083020) from the CAPMC that was originally collected by the Bureau of Reclamation in Kern County. The trials are being conducted at four PMC locations with replicated trials. Data collected during the year on spring recovery, first flowering date, seed set, disease development, drought tolerance, biomass production and persistence will be analyzed over the four locations.

Seed and Plant Production

Foundation seed production

The CAPMC develops and releases plant species to solve specific resource conservation needs. The CAPMC has a responsibility to maintain foundation seed of our plant releases. In 2011, 'Rio' beardless wild-rye (*Leymus triticoides*), 'Southern Cal 1000 germplasm' California brome (*Bromus californicus*) and Purple needle grass (*Nassella pulchra*) were grown successfully and the seed stock renewed. These important species are used often for revegetation and restoration of degraded lands in California.

Figure 4: Foundation field of 'Southern Cal 1000' California brome.

In preparation for seed harvest in 2012-2013 container grown California native foundation plants were planted including, 'Casa' quailbush (*Atriplex lentiformis),* 'Duro' California buckwheat (*Eriogonum fasciculatum)*, 'Sierra' sulfur flowered buckwheat (*Eriogoum umbellatum)*, and 'Lassen', bitterbrush (*Purshia tridentata).* In addition, 'Mariposa' blue wild rye (*Elymus glaucus*) seed was field planted in the fall.

Due to an increased interest from commercial growers in cover crops, legume releases 'Monte frio' rose clover (*Trifolium hirtum*), 'Lana' woolypod vetch (*Vicia villosa* subsp *varia*), and 'Zorro' fescue (*Vulpia myuros*) were seeded into fields for harvest in 2012.

Cooperative Planting

During 2011 the CAPMC continued to work with the BLM and the Seeds Of Success program to harvest 37 collections of native plant species. In addition to collecting seed, CAPMC staff established stands of several native grasses targeted for seed increase: blue wild-rye (*Elymus glaucus),* squirreltail, *Elymus elymoides,* California fescue *(Festuca californica)* and purple needlegrass (*Nassella pulchra*). These were established as plugs with buried drip irrigation; an improvement possible due to the upgrade to the CAPMC irrigation pump during 2010.

Figure 5: California Fescue, *Festuca californica*, irrigated with buried drip in November 2011.

In addition, in support of restoration activities in Sequoia/Kings Canyon National Park, we planted seed of blue wild rye (*Elymus glaucus)*, California brome, (*Bromus carinatus)* and miniature lupine, (*Lupinus bicolor*) for harvest during 2012.

Off-Center Trials

Restoration of Burned Saltcedar (*Tamarix* spp.) and Flood Disturbed Riparian Sites Along the Mojave River.

A Conservation Field Trial (CFT) was established near Victorville, CA, in October 2011, to evaluate techniques to restore riparian habitat in the absence of irrigation in Mojave River flood plain where there had been large-scale Tamarisk removal for the last four years. Following Tamarisk removal, the CFT contained sparse vegetative cover, primarily of native desert saltbush, fourwing saltbush, and mixed annual and perennial forbs.

Figure 7: Site of CFT at the Mojave River, Victorville.

Treatments addressed seed and seedbed (microsite) preparation, native species selection, moisture capture and conservation, salinity remediation and microbial augmentation. Ken Lair, from the CAPMC, collaborated with local partners Victor Valley College, Lewis Center for Educational Research, Mojave Water Agency, CA Dept of Fish and Game, and Mojave Desert Resource Conservation District.The site will be monitored for the next three years with the results widely applicable to other desert riparian sites.

Dichelostema capitatum (nahavita, blue dicks): response to Big Pine Paiute Harvesting regimes

The corms of Nahavita or blue dicks were an important component of the diet of tribes throughout California prior to the arrival of Europeans and are regaining the attention of the Big Pine Paiute Tribe. Often termed "Indian potatoes" and abundantly harvested, they comprised an important starch and protein dietary component of indigenous people. Knowledge of harvest practices has been lost since European settlement so a CFT was established near Bishop,CA, that explores the effects of a variety of harvesting practices on growth of corms.

Figure 6: Nahavita corms held by members of the Big Pine Paiute Tribe.

The CFT study site was selected in coordination with the Big Pine Paiute Tribe tribal elders and technical staff members associated with tribal cultural history and environmental health. Ken Lair, from the CAPMC, and NRCS ethnoecologist Kat Anderson collaborated with the tribe and eight local partners to establish and monitor the trial.

Outreach

USDA People's Garden

In April 2011, CAPMC staff installed a garden in support of the USDA People's Garden Program in partnership with The Center for Land Based Learning with the objective of community education and producing vegetables to donate to the local foodbank.

Figure 8: Peoples Garden showing small site with vegetables and sunflower, June 2011.

The garden demonstrates best practices by installation of drip line, crop rotation, integrative pest and weed management and companion planting. Activities provided an educational opportunity for community members and volunteers who helped tend the garden, and groups touring the PMC. There was a 644 lb. donation of fresh vegetables to the local food bank.

Figure 9: Margaret Smither-Kopperl (PMC Manager) explains native plant propagation to students from Cesar Chavez High School.

Three groups of high school students in the SLEWS program (Student and Landowner Education and Watershed Stewardship) visited to learn about the Plant Materials Program.

3rd Annual Native American Field Day for Youth

Our Field Day was held at the PMC on July 27, with approximately 80 attendees from several local tribes. The day was a great success, starting with a visit to the USDA People's Garden to demonstrate vegetable gardening. The garden is sited adjacent to stands of plants (e.g saltgrass, elderberry) that have cultural significance and play a role in the health of the garden.

Figure 10: Don Hankins demonstrates plant materials in riparian area during Tribal Day for youth, July 2011.

Don Hankins (Plains Miwok and Assoc. Prof. CSU, California State University, Chico) demonstrated native plants for food and fiber and their management in the riparian area along the Mokelumne River. This area was previously important to the Plains Miwok. Culturally significant plants include Santa Barbara sedge, *Carex barbarae* and willows *Salix* spp. for basketry,

Technology Transfer

Training conducted at the PMC in 2011 included ALMANAC training for western PMC staff, and Pollinator Hedgerow training for Field Office staff. Three groups of new NRCS employees attending Orientation for New Employees, toured the CAPMC and received training detailing the Plant Materials Program. Additional tours were provided as part of the annual meeting of California Resource Conservation Districts, International Plant Propagation Society, and the Clements Garden Club. PMC staff also provided numerous presentations. Publications included a Tech Guide on Seedling Identification Guide for Pollinator Hedgerow forbs of California's Central Valley.

Staff

Staff at the PMC went through major transitions during this year. Our current staff members are:

Margaret Smither-Kopperl, Manager
Jeremiah Mann, Agronomist
Dennis Frommelt, Farmer
Amy Gomes, Biological Science Technician
Larry Sell, Farm Technician
Shawn Vue, Admin/Tech Assistant

Figure 11: Fall planting crew, Larry Sell, Jeremiah Mann, Amy Gomes and Shawn Vue.

Visit the CAPMC Web site for information and publications: http://plant-materials.nrcs.usda.gov/capmc