



Figure 1. Lockeford Plant Materials Center.

The Lockeford Plant Materials Center (CAPMC) is a 106-acre facility located in the Central Valley of California and is the only PMC within the state. The mission of the CAPMC 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. This year has seen several improvements to the facilities at the CAPMC, and this increases our capacity to assist with resource concerns within California.

Irrigation

A pressurized irrigation system was installed at the CAPMC in March 2012. This improvement increases efficiency and control to irrigate our various projects.



Figure 2 Trenching machine used for installation of irrigation system during February 2012.

Equipment available for irrigation includes hand line, wheel line, subsurface drip irrigation, and the previous surface irrigation system. Systems are available for demonstration and training of field office staff.



Figure 3. NRCS Field Office staff work to set hand line for sprinkler irrigation at the "Irrigation Bootcamp".

The CAPMC hosted an "Irrigation Bootcamp" put on by Engineering staff Dan Johnson and Greg Norris for 20 NRCS staff in May 2012.

Soil Health Study

The CAPMC is one of six PMCs participating in a National Soil Health Study to examine the effects of mixed species cover crops on soil health. The study will also determine optimum seeding rates for mixes and demonstrate the use of these cover crops in rotation with corn as an example of a commodity crop. The trial was planted after extensive soil monitoring in October and data collection will continue for 3 years.



Figure 4. Planting plots for Soil Health Study in October 2012.



Figure 5. Growth of cover crops (Dec 7) in Soil Health Study.

Cover Crops

Cover crop demonstrations were planted in fall of 2011 and 2012 with individual plots planted to components of cover crops available in California including grasses, legumes, brassicas and natives. Photo monitoring conducted at 15 day intervals provided information on cover and weed suppression.



Figure 6. Cover crop demonstration 60 days after planting, January 2012.



Figure 7. The cover crop demonstration planting during an Open House at the PMC in April.

These plots were a stopping place during the April Open House at the PMC in April. Cover crops are becoming increasingly important to California agriculture to solve resource concerns. The NRCS and the CAPMC is a partner with UC as part of their emphasis on the California Agriculture Systems Innovation (CASI).

Pollinator Plantings

The CAPMC has developed a strong partnership with the Xerces Society in support of pollinator habitat. Pollinator meadows were planted in fall of 2011 in a partnership with the Xerces Society and UC Davis. The trial includes four ~0.25 acre plots containing different seed mixes, including 2 commercially available from the Xerces Society and Hedgerow Farms. All plots established well without irrigation, even with an exceptionally dry winter, some initial weeding was required for control of non-natives. The plots contain mixtures of annuals and perennials and are monitored biweekly for establishment/cover and bloom phenology. Monitoring will continue over three years.



Figure 8. Pollinator meadow, 'Almond mix' with California poppy, baby blue eyes and lupine, April 4 2012

BioFuels Results

Camelina, *Camelina sativa* is an oil seed crop that offers potential for California farmers, yielding high quality oil. UC Davis established camelina variety trials at Davis and at Five Points, CA and at the CAPMC in 2011. The trials were harvested in May 2012 and evaluated 10 different cultivars of camelina for yield and oil quality.



Figure 9. Camelina trial with plots of ten cultivars March 23.

Seed and Plant Production

Foundation seed production

The CAPMC develops and releases plant species to solve specific resource conservation needs. The CAPMC continues to produce seed of PMC developed plant releases to ensure that the seed is available to commercial seed and plant producers and for NRCS demonstration plantings. Most of these are native plants and important for revegetation and restoration; seed harvested included 'Sierra' sulphur flower buckwheat, and 'Mariposa' blue wildrye.



Figure 10. 'Sierra' sulphur-flower buckwheat foundation plants for seed.

Two non-native CAPMC releases 'Lana' woollypod vetch and 'Zorro' annual fescue, have generated recent interest as cover crops and these annual crops were also grown and harvested during 2012.

Cooperative Planting

During 2012 the CAPMC continued to work with the BLM and the Seeds Of Success program and the National Park Service. This work benefits NRCS with additional funds and provides the opportunity for the PMC to investigate native plants with potential application for conservation programs. We hosted two interns Marc Bliss and Patrick Nicholson from the Chicago Botanical Gardens who made 24 collections of native plant species. They also assisted with plant propagation and on farm activities. Seed was harvested for the BLM program from 2011 stands of native grasses including blue wild-rye (*Elymus glaucus*), squirreltail (*Elymus elymoides*), California fescue (*Festuca californica*) and purple needlegrass (*Nassella pulchra*).

In collaboration with the Cosumnes Preserve and a planned restoration of the Cougar Wetlands, additional plantings were made of spike bentgrass (*Agrostis exarata*), gumweed (*Grindelia camporum*) and bee thistle (*Eryngium articulatum*).



Figure 11. Purple needlegrass (*Nassella pulchra*) for seed harvest.

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



Figure 12. Miniature lupine for seed production in bloom.

Outreach

The CAPMC held an Open House for NRCS and RCD staff in April with tours of the facility and plantings of cover crops and pollinator habitat. Trainings at the CAPMC during 2012 included the 'Irrigation Bootcamp', Cover Crops 101 and a Propagation workshop for Tribal members. We hosted a USDA People's Garden, with thanks to the efforts of CSU Stanislaus intern Monica Burkner that provided food to our local food bank.

Riparian Restoration

We are partnering with the SLEWS (Student and Landowner Education and Watershed Stewardship) program from the Center for Land-Based Learning for riparian habitat restoration on the Mokelumne River at the CAPMC. This project, with funding from the National Fish and Wildlife Foundation, started in the fall of 2012 and will enable local Lodi High School students to help design and implement a riparian restoration project in the Mokelumne River Watershed. The area along the levee at the PMC chosen for this activity was overgrown with Himalayan blackberry and will be restored to native vegetation.



Figure 13. Clearing of Himalayan blackberry along the levee.

With two Field Days so far in 2012, the students and mentors have cleared invasive blackberries, planted Santa Barbara sedge plugs and are propagating the CAPMC release 'Rio' beardless wildrye for transplanting during 2013.



Figure 14. Students in the SLEWS program seed flats with 'Rio' beardless wildrye.

Tribal Outreach

Our collaboration with California Native American tribes continued during 2012 as we work to support their interest in promoting plants of cultural significance. Included in our activities was a Tribal Youth Work Day in March, in which students learned about tree pruning and tending milkweed planted in 2011.



Figure 15. Students from Sierra Native Alliance tree pruning.



Figure 16. Narrow-leaved milkweed, with lady beetle.

A Propagation Workshop for Tribal members was held in November with emphasis on propagation of local plants for tribal nurseries and gardens.

Publications

New or revised Plant Guides were completed in 2012 for the following: bladderpod, buckbrush, California poppy, sticky whiteleaf Manzanita, and sulphur-flower buckwheat. Revised and new release brochures were completed for ten CAPMC releases and these publications are all available on the CAPMC website: <http://plant-materials.nrcs.usda.gov/capmc>

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