

# Lockeford Plant Materials Center

## 2022 Progress Report of Activities

December 2022

Website: [California - Lockeford Plant Materials Center | Natural Resources Conservation Service \(usda.gov\)](https://www.usda.gov/nrcs/california-lockeford-plant-materials-center)

The mission of the USDA NRCS Plant Materials Program is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs, with the current major focus areas of Cover Crops and Climate Change. The Lockeford Plant Materials Center (CAPMC) provides information about adapted plants and conservation practices to NRCS staff and their clients, producers, landowners and tribes of California. We are a 106-acre facility located in the Central Valley of California and the only PMC within the state. The CAPMC is responsible for the Mediterranean areas of California: the Northwest is covered by ORPMC, Corvallis, OR; the Great Basin and High Desert by GBPMC, Fallon, NV; and the southern desert areas by AZPMC, Tucson, AZ.

During 2022, Annie Edwards, Study Leader, joined us from her most recent job at the Aldo Leopold Foundation in Wisconsin and Shawn Vue took on additional responsibilities as Farm Foreman after working at the CAPMC over ten years. In August, we hosted 1994 Tribal Scholar, Charles Goodluck from the Navajo Nation for four weeks. We have taken the opportunity to pivot from an emphasis on annual cover crops to initiating studies on perennial species for conservation cover especially in orchards and vineyards. This has been a banner year for technology transfer through outreach and trainings, and CAPMC publications including Study Reports and Technical Notes are available on our [website](https://www.usda.gov/nrcs/california-lockeford-plant-materials-center).

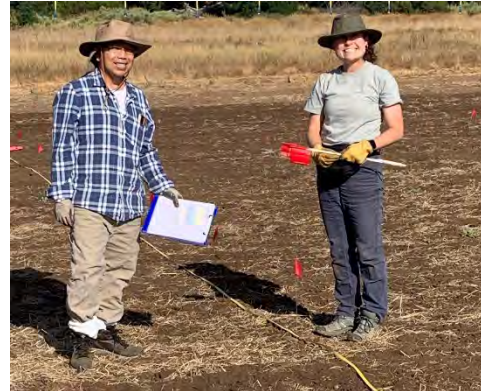


Figure 1. Farm Foreman, Shawn Vue and Study Leader, Annie Edwards flagging out plots for planting a study. Photo M. Smither-Kopperl.

### Cover Crops



Figure 2. Cool season cover crop plots during the April 6 Field Day, note brassica plots in bloom to the right. Photo Annie Edwards.

PMCs in AZ and NV, to provide information on drought tolerant warm season cover crops for the southwestern US. The study included eight different millet species, three cowpea cultivars and 'Tropic Sun' sunn hemp. The study was planted in mid-July and 2 inches of irrigation water were applied after planting. Our aim is to evaluate the potential of these species to grow and provide cover after summer row crops, such as tomato, with minimal water use as well

Over the past 10 years the CAPMC has conducted many studies on cool season annual cover crops, producing applicable Study Reports and Technical Notes.

During 2022, for the 10<sup>th</sup> year, we planted a demonstration with 40 plots including cereals, legumes and forbs plus commonly planted mixes and native species. Also, included was a planting of small-seeded fava beans and oats for a study with Dr Hossein Zackeri and CSU Chico.

A second year of a regional warm season cover crop study was planted in collaboration with the

as evaluate the differences between cultivars and species. Warm season species die with cold temperatures in fall, but their presence increases infiltration with fall rains and prevents soil erosion.

### Perennial Species for Conservation Cover

Conservation cover is an NRCS practice (327) to establish and maintain permanent vegetative cover that may be used in orchards and vineyards. Perennial species provide the advantages of annual cover crops, such as increased soil organic matter and nutrient cycling, increased infiltration of irrigation water and precipitation, prevention of soil crusting and cracking, potential reductions in compaction, as well as, weed suppression and habitat for pollinators and beneficial insects. As these species are not replanted each year, they potentially carry less risk, because weather and drought conditions affect establishment with less frequency. Some maintenance is required, depending on the species, typically by mowing or grazing. Our objective for a 2021 study was to evaluate 8 commercially available mixes of grasses and pollinator species, including perennials and reseeding annual species, over 5 years. The study has large, replicated plots and is not expected to require irrigation once species are established. Drought conditions during January and February required us to apply 2 inches of irrigation to ensure establishment, this is a fraction of our normal rainfall during those months. The plots are being assessed for cover and persistence.



*Figure 3. Oakville Bluegrass a mixture of *Poa bulbosa* varieties, 60 days after planting. Photo Shawn Vue.*



*Figure 4. Central Valley pollinator mix with tillage radish and crimson clover at 60 days after planting. Photo Shawn Vue.*



*Figure 5. Central Valley pollinator mix with crimson clover in full bloom April 26, 2022. Photo Annie Edwards.*

An additional replicated perennial species study including native and non-native species of grasses, legumes and forbs was planted in the fall of 2022. The objective is to evaluate these species for adaptation to conditions in the Central Valley of California. The species selected were commercially available materials and included native California species as well as plant releases from other Plant Materials Centers in the southwestern US. The plots will be managed by mowing and no irrigation will be applied. We anticipate a collaboration with Soils and Soil Health to assess changes in the soil over the five years of the project.

### Publications

Technical documents are posted on the CAPMC website and California's [Field Office Technical Guide](#). New and revised publications in 2022 include:





- Plant selection tool for NRCS Conservation Practices
  - eVeg Guide continues to be updated and can be accessed at this location: [NRCS eVegGuide 5 \(calflora.org\)](https://www.nrcs.usda.gov/evegguide)
- Plant Guides:
  - [California wild grape, \*Vitis californica\*, Plant Guide \(usda.gov\)](https://www.ars-grin.gov/cgi-bin/npgs/html/init.pl?plant=100000)
  - [Island Ironwood, \*Lyonothamnus floribundus\*, Plant Guide, \(usda.gov\)](https://www.ars-grin.gov/cgi-bin/npgs/html/init.pl?plant=100000)

## Outreach

The CAPMC continues to support outreach with Areas and Service Center Staff as well as partners.

We held two on-site Field Days during 2022:

- Cool Season Cover Crop and Soil Health Field Day was held on April 6, our first Field Day since the COVID closure, with about 60 participants (Figure 6).
- Warm Season Cover Crop and Late Season Pollinator Plantings Field Day was held on September 15. In addition to field stops, a panel discussion on Native Seed production and availability was held with participants from Hedgerow Farms, Great Valley Seed, and Heritage Growers (Figure 7).



Figure 6. Margaret Smither-Kopperl, CAPMC Manager and Z. Kabir, NRCS Soil Health Specialist, soil demonstration.



Figure 7. Billy Synk, Pollinator Partnership speaks on perennial pollinator plantings in the milkweed planting.

Additional presentations were made at Field Days and Tours around the state:

- Sacramento Valley Cover Crop Tour organized by the SW Chapter of the [Western Cover Crop Council](https://www.westerncovercropcouncil.org/).
- Fava Bean Field Day –Solano Community Gardens, Los Angeles, an example of Urban Agriculture.
- Warm Season Cover Crop Field Day, Colusa County, University of California.

For the third year, the CAPMC was pleased to host the Xerces Society, for their Monarch Kit distribution event in November.

## Trainings

CAPMC staff contributed to three trainings conducted virtually during 2022, each was 3<sup>1</sup>/<sub>2</sub> hours in length and provided Conservation Planning credits.

- Introduction to the eVeg Guide, the plant selection tool for NRCS staff in California.
- Introduction to 340 Cover Crop Planning.
- Planning a Seeding – focus on Range plantings.

The ‘hands on’ component of NRCS Soil Health training was held at the CAPMC in June, with participants investigating the differences in soil health under different types of management, including tillage, cover cropping, hedgerows and a neighboring orchard.

## Tribal Partnership Activities

The CAPMC supports tribes and their interactions with NRCS through a variety of channels including:

- A presentation to the California Association of Resource Conservation Districts on ‘Tribal Engagement-Creating Strong Partnerships’.
- Several assessment visits to a planting of Cultural Significance at Dos Rios at the confluence of the San Joaquin and Tuolumne Rivers. The planting will be available for gathering by local Miwok tribes.
- 1994 Tribal Scholar, Charles Goodluck participated in PMC onsite activities and visited the Dos Rios site, as well as the Wilton Rancheria.
- A Cultural Burn was held on November 26 at the CAPMC (Figures 8 and 9)



*Figure 8. Cultural burn in the riparian area, to regenerate white root sedge beds used for basketry, also for reduction of invasive weeds. Photo M. Smither-Kopperl.*



*Figure 9. California poppy in bloom right after the cultural burn, note the blackened remains of weedy annual grasses surrounding the plant. Photo M. Smither-Kopperl.*

The planning of the Cultural Burn began in 2021, led by Burn Boss, Don Hankins, Professor of Pyrogeography at CSU Chico State and Governor’s Cultural Burning Representative, and Chris Zimny, NRCS State Forester. Don had worked with local Me-wuk tribes 20 years ago to carry out a successful cultural burn adjacent to the Mokelumne River, but the area is now overgrown. Major objectives for the 2022 PMC Cultural Burn included training for NRCS and Fire Department (FD) staff, reducing non-native vegetation regrowing in the riparian area, reestablishing sedge grasses and elderberry plants, and reducing wildfire hazards along the river. The event included members from local Miwok tribes, the Mokelumne FD, CalFire and the State Water Board. The areas burned included 5-acres planted to pollinators and native grasses with weedy grasses and 3 patches of riparian areas.

### Contact Information

For more information: email: [Margaret.Smith-Kopperl@usda.gov](mailto:Margaret.Smith-Kopperl@usda.gov), Telephone: 209 400 1531  
Address: Lockeford PMC, 21001 N. Elliott Road, (P.O. Box 68), Lockeford, CA 95237  
the CAPMC website. [California - Lockeford Plant Materials Center | Natural Resources Conservation Service \(usda.gov\)](#)



*USDA is an equal opportunity provider, employer, and lender.*