

2010 Progress Report of Activities

Pollinator Hedgerows



The pollinator hedgerows at the California Plant Materials Center (CAPMC) were designed by NRCS State Biologist, Tom Moore, in collaboration with the Xerces Society for Invertebrate Conservation. The hedgerows contain a mixture of shrubs and perennial and annual native grasses and wildflowers selected to provide pollen and nectar resources to pollinators for most of the year. They were planted in January and November of 2009 to demonstrate the potential use of hedgerows for pollinator habitat under different irrigation systems (non-irrigated, furrow, drip and micro-spray).

Starting in May 2010, hedgerows were monitored on a bi-weekly basis for survival of shrubs and forbs planted from container stock to see how plants performed under different irrigation regimes. Percent bloom of all species was also monitored bi-weekly to track resource availability for pollinators. Monitoring will continue through the winter and spring in order to compile a full year's worth of data that can be used for planning future hedgerow plantings.

Sunn Hemp Trial

The CAPMC participated in a national inter-center strain trial to collect information on the adaptability and use of 'Tropic Sun' sunn hemp (*Crotalaria juncea*) in California. Sunn hemp is a warm season legume native to India and Pakistan that tolerates poor, sandy, droughty soils, yet is capable of producing a large quantity of biomass in a relatively short 60-90 day growth period. The species has been recommended as a quick N-fixing crop following early sweet corn or processing tomatoes, or preceding fall planted grains or brassicas. Using seeding rates of 20, 40 and 60 lbs/acre, replicated plots of sunn hemp were planted on Aug 12, 2010 at the CAPMC. Biomass yields were somewhat variable within seeding rates. At 45 days, the average biomass for the plots was 1,360, 1,840 and 2,440 lbs/acre for the 20, 40 and 60 lbs/acre seeding rates, respectively. At 60 days, biomass production averaged 3,790, 5,190 and 5,940 pounds per acre, respectively. By the end of the trial at 60 days, some of the plants were starting to bloom, and average plant height was 1.07 m (3.5 ft). Reliable data on N-fixation by sunn hemp is not readily available, though estimates in popular literature for a 60-90 day crop are approximately 100 lbs N/acre. The CAPMC staff hopes to plant an early summer (June/July) planting of 'Tropic Sun' sunn hemp in 2011 in order to develop a recommendation for cover crop/green manure planting in the San Joaquin Valley.



'Tropic Sun' sunn hemp, CAPMC, Oct 2010.

Alkali Sacaton ICST

On August 18, 2010, staff planted a western US-focused inter-center strain trial (ICST) of alkali sacaton (*Sporobolus airoides*) at the CAPMC. 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 which was originally collected by the Bureau of Reclamation in Kern County. The four entries were planted into plots replicated four times using a Randomized Complete Block Design. Data will be collected on spring recovery, first flowering date, seed set, disease development, drought tolerance, biomass production and persistence.

The plot established well and grew rapidly this summer with irrigation as needed through mid-September; the plot will not be irrigated in subsequent years.



Alkali sacaton seedhead, CAPMC production field, 2010.

Melica Initial Evaluation Planting

In 2008 and 2009, CAPMC staff made collections of melic grass (*Melica* spp) from 54 sites throughout California. In 2010, plots of these collections were established in a production setting at Hedgerow Farms in Yolo County, and in a fenced rangeland setting in Calaveras County, in order to evaluate their establishment, adaptability, and other traits for use in rangeland and wildland restoration. The plantings included five *Melica californica* industry standards, and were replicated three times in Calaveras, and two in Yolo.



Melica plot at Hedgerow Farms, Yolo County, 2010.

Observations from the first year indicated the presence of at least two *Melica* species, both with dark green basal foliage and 18-36" average seed head height. The unexpected species in the plot exhibited a moderate rhizomatous habit not typical for California melic, and is perhaps a facultative summer dormant grass; the accessions of *Melica californica* displayed a bunchgrass habit and the more typical obligate summer dormancy. Confirmation of identity for these collections will occur when the plants flower this spring.



Melica rangeland planting, Calaveras County, 2010.

California melic is a medium-sized, loosely tufted, perennial bunchgrass endemic to California. It is a cool-season grass which survives the summer dry season by storing necessary starches in a swollen, bulb-like area at the base of the stem. The grass is most common on open hillsides in full sun, partially shaded fringes of oak woodlands, open canopy mixed evergreen forests, and yellow pine forests; it is also noted as occurring on coastal benches and meadows. Small stands can sometimes be found in near- to full shade. The plant is generally found below 2,100 m (4,000 ft) in bioregions that ring the San Joaquin and Sacramento Valleys.

Seed Collection for Seeds of Success Program

A five-year interagency agreement with the Bureau of Land Management (BLM) is providing the CAPMC with funding to collect native plant species in coordination with the Seeds of Success (SOS) Program. The SOS Program supports the systematic collection and development of native plant materials (www.nps.gov/plants/sos/). It supports native species research and provides the initial seed stock for commercial seed/plant increase for revegetation of sites following disturbance. The similarity between the missions of SOS and the CAPMC make this collaboration particularly important.

In 2010, Agronomists Christina Smith and Annie Young-Mathews made 30 seed collections of 23 plant species from different regions of California. Propagation of several collections began this year for eventual seed increase and/or container production for specific BLM field office restoration projects.

Plant Growth Data Collection for ALMANAC Model

This year the CAPMC participated in a collaborative project with the Agricultural Research Service (ARS) and four other western PMCs. ARS's ALMANAC (Agricultural Land Management Alternative with Numerical Assessment Criteria) model uses relevant data on important western rangeland species to predict plant cover and forage production of plant functional groups under different climatic conditions. These data will be used in the vegetation tool for the rangeland CEAP (Conservation Effects Assessment Project). The species studied this year in Lockeford were a rhizomatous grass, saltgrass (*Distichlis spicata*), and a shrub, bladderpod (*Cleome isomeris*). Plant growth data including biomass production, nutrient content, leaf area and light interception measurements were collected. A new weather station was installed at the CAPMC in order to collect the necessary climate data for the ALMANAC model. The station has the capability to record a variety of climate parameters including air and soil temperatures, relative humidity and photosynthetically active radiation.



New weather Station at the CAPMC

Plant Materials Program Review

A national Plant Materials Program review took place at the CAPMC in September 2010. The review was led by John Englert, National Program Leader for Plant Materials, Jim Briggs, Regional Plant Materials Specialist from the Western Region, and Joel Douglas, Regional Plant Materials Specialist from the Central Region. The review participants included Diane Holcomb, CA State Resource Conservationist and Rita Steiner, State Agronomist and Plant Materials Specialist and interviews were made with a local grower and CAPMC collaborators as well as all staff members. The review included a tour of the site and facilities and overview of all records of the CAPMC for the past five years.



Participants in Program Review: Back row; John Englert, Jim Briggs, Ken Lair, Dennis Frommelt, Diane Holcomb, Christina Smith, Front row; Joel Douglas, Daniel Meyer, Anna Young Mathews, Margaret Smither-Kopperl.

Facilities and Equipment

Since its establishment in 1973, the irrigation needs of the CAPMC have been met by surface irrigation, apart from landscaping around the office and a small area of drip irrigation. In 2010, the well pump was functioning at 21% efficiency. The poor state of the irrigation system reduced the capacity of the CAPMC to serve the conservation needs of

California where water quantity, quality and water-use efficiency are major resource concerns. During 2010 the irrigation system was given a major upgrade, with installation of a rebuilt pump that will be capable of providing water for a pressurized irrigation system throughout the fields.

Farm equipment was upgraded by purchase of a cultipacker, grass seed header, bed-shaper and planter. The office facilities were improved by replacing the roof with a new energy-efficient "cool roof". Accessibility within the building was improved by some structural changes to the front office and bathrooms, and by replacing the flooring.

Pollinator Hedgerow Workshop

A Pollinator Hedgerow workshop was held at the CAPMC on May 25, 2010. The workshop was organized by John Brodie, RCD and the Lower Mokelumne River Watershed Steering Committee, with Jessa Guisse, CA Pollinator Outreach Coordinator from the Xerces Society. The meeting included presentations on hedgerows and pollinators, demonstrations of planting equipment, and discussion of soil preparation and hedgerow establishment. In all, 22 people attended the workshop, including representatives from NRCS Field Offices, UC Davis and farmers and grower.



Jessa Guisse at hedgerow workshop



Reina Rogers discusses native plants.

2nd Annual Native American Field Day for Youth

The Tribal Youth Field Day was held at the CAPMC on July 29, 2010. The CAPMC has a history of working with the local Native American groups, making plantings of cultural significance to Native Americans and supporting Indigenous Stewardship Methods.

The Field Day commenced with an introduction by Reina Rogers, NRCS Tribal Liaison, then continued with a walking tour of the PMC that included an area dedicated to future plantings of culturally significant plants, and sedge beds adjacent to the river that are managed for basketry. After a picnic lunch, the Field Day concluded with presentations basketweaving and techniques by California native basketweavers.

Technology Transfer

In addition to the workshops above, several trainings were held at the CAPMC during 2010 including two tours for Orientation from New Employees of NRCS and Energy Audit Training. Publications included Plant Guides (PG) on Beardless Wildrye, California Sagebrush, a Fact Sheet and PG on Manystem WildRye, newsletters and popular articles.

About the CAPMC

The Lockeford Plant Materials Center is one of 27 centers nationally and serves the majority of the land area of California including the coastal areas, the Central Valley and Sierras, but excluding the desert southwest, the area east of the Sierras and the northern forests. The mission of the California Plant Materials Center (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 seedproducers and nurseries. The majority of our work focuses on species that are native to California. For more information about the topics covered here visit our

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