Year 2004 Lockeford Plant Materials Center Progress Report of Activities

P.O. Box 68, 21001 N. Elliott Road, Lockeford, CA 95237 Tel: (209) 727-5319 Fax: (209) 727-5923

The mission of the California Plant Materials Program and the Lockeford Plant Materials Center (PMC) is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. There are 26 PMC's nationwide, each serving a particular geographic area. The Lockeford PMC serves the Mediterranean climate portions of California.

The Lockeford PMC was established in 1972 to develop promising plants and test their performance under a variety of soil, climatic and use conditions. Over the past 50 years, 29 plants have been released for commercial seed production to solve soil and water conservation problems.

PMC Research, Studies & Activities

The Lockeford Plant Materials Center is addressing the following priority resource issues:

- Develop cover crops, vegetative barriers and windbreaks for controlling erosion on cropland
- Develop improved plants for wildlife food and cover
- Establishing vegetation after wildfires
- Utilize plants in disturbed areas, such as construction sites and mine spoils
- Establishing vegetative strips to improve water quality along waterways
- Develop salt tolerant plant cultivars
- Utilize native plants for ecosystem diversity

United States Department of Agriculture
NRCS Natural Resources Conservation Service

Most of the following new studies were requested from Natural Resources Conservation Service (NRCS) Field Office staff as part of FY2004 requests for NRCS State Office assistance. NRCS Field Office staff worked closely with PMC Manager Dave Dyer to develop these studies, and in some locations they took the lead.

Many landowners helped with site preparation, plot layout, fencing, planting and application of treatment materials and management treatments. Also, due to NRCS Field Office and Lockeford PMC staff networking efforts, many NRCS partners and Resource Conservation Districts helped make these studies possible.

Aerial view of the NRCS Lockeford Plant Materials Center complex. The Center has provided state-of-the-art plant science technology to customers since its establishment in 1972.

Soil Sequestration of Carbon & Biomass-to-Ethanol CFTs

The Woodland and Red Bluff Field Offices and Area Office staff are continuing work on this five-year study with the PMC, universities and USDA-ARS to determine native and introduced grass carbon sequestration levels and their potential for ethanol production.

Cover Crop Demonstration & RUSLE Study

Thirty-six introduced and native cover crop varieties were planted fall 2001 in 20x20 foot plots as a demonstration area and as an opportunity to evaluate growth and ground cover for use in Revised Universal Soil Loss Equation (RUSLE). Every two weeks, height is measured and ground cover is estimated in each plot. Plant Materials Technical Note 71, Percent Cover and Height Data For RUSLE2, was recently completed. This will aid in implementing Farm Bill programs.

PMC Manager Dave Dyer performing a field evaluation.

Elkhorn Slough Watershed Grass Trials (Planted November 2003)

The purpose of this conservation field trial is to introduce agricultural producers—especially limited resource and Spanish-speaking farmers—to the use of various grasses. The primary emphasis is on native grasses for erosion control, wildlife habitat benefits, and other uses such as grazing for livestock. Twenty-seven species were planted with three replications. The work is being carried out with the assistance of Agricultural Land-Based Training Association (ALBA) and the Triple M Ranch. RUSLE data (height and percent cover) is being collected every two weeks.

BOR Native Plant Evaluation Project

The PMC started a $100,000 two-year project with the Bureau of Reclamation (BOR), which will provide a means to augment the limited supply of native San Joaquin Valley plant materials to be utilized in the restoration efforts on 200,000 acres of retired agricultural land. This project involves working with BOR, Bureau of Land Management (BLM), and Endangered Species Recovery Program (ESRP).The project goal is to develop foundation seed that can then be used by the seed industry to grow large quantities and to determine which native species can be grown on a large scale using agricultural machinery.

In 2004, 20.3 pounds of seed were harvested and cleaned from the fabric seed production area. From the 29,310 plants propagated, 6,000 germinated and were planted on the fabric area for weed control and ease of seed harvest. Detailed seed cleaning records and propagation records were maintained to determine which species had the greatest potential for large-scale increase. A two-acre area was prepared, and five species were planted for large-scale increase in fall 2004.

Sequoia/Kings Canyon National Park Seed Production Project

During FY2004, six different species were grown at the Lockeford PMC for maximum seed production. A total of 190 pounds of pure live seed (PLS) was produced at the PMC. The PMC propagated 6,000 plugs of three species for transplanting on an area that was covered with weed control fabric. The fabric allowed shattered seed to be vacuumed with no soil.

Trifolium cilioatum garnered 41 clean pounds of seed with a 99.91% purity.

This project started in FY2003 and will be completed in FY2005. The overall goal of the project is to produce 150 PLS pounds of seed from six species.

All initial seed collection was accomplished by the National Park staff. The seed was cleaned by PMC staff and tested by a seed laboratory. The initial cleaned seed was used to propagate plants for placement on fabric (5,000 sq. ft., with one foot spacing) of three species (Trifolium ciliolatum, Lupinus bicolor, Poa secunda) and direct seed three species (Melica californica, Elymus glaucus, Bromus carinatus) on 30-inch rows, .5 acre each. The three species on the fabric were hand harvested, and shattered seed was vacuumed off the fabric. The three direct seeded species were harvested using a FailVac harvester. All seed was cleaned and tested.

Tulelake Inter-Center Strain Trial TN-Plant Materials-73, February 2005

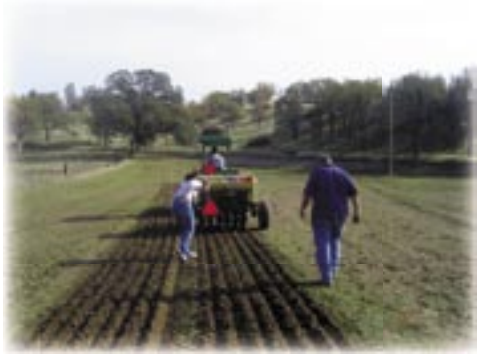
The Tulelake Inter-Center Strain Trial (ICST) was established to determine the best conservation plant materials to use in conservation practices funded by Farm Bill programs in the Tulelake area (MLRA 21). Forty-two grasses, shrubs and legumes were established in spring 2002, and evaluated for stand establishment, height, seed amount, seed fill, vigor, weed suppression, lodging, cold/frost damage, and wildlife value. The site was irrigated and weed control was provided. An additional ICST site was planted in Dorris in fall 2002, and this site was not irrigated.

When supplemental irrigation water is applied for initial stand establishment, there is an overall excellent stand establishment. The varieties that had excellent results over three years are: Largo Tall Wheatgrass, San Luis Slender Wheatgrass, Magnar Basin Wildrye, Hycrest Crested Wheatgrass, Reliant Intermediate Wheatgrass, and CDII Crested Wheatgrass.

When supplemental irrigation water is not applied, there is very poor stand establishment. At the Dorris planting site, only Tusas Bottlebrush Squirrel Tail and Jose Tall Wheatgrass produced small stands consisting of 10 percent cover and a height of 24 inches.

The shrubs did not have great success when direct seeded. However, when planted as seedlings, Lassen Bitterbrush, Great Basin Fourwing Saltbush and Great Basin Big Sagebrush did exceptionally well, with one to two feet of growth the first year. The use of landscape fabric, fertilizer tablets and rodent guards ensured success.

Bromus carinatus, one of six species grown at the PMC for maximum seed production.



Red Bluff Field Office staff planting a rangeland seeding study that involved both native and introduced species. The goal is to determine the best way to establish perennial grasses in an annual grass/weed system.

NRCS Natural Resources Conservation Service

PMC Tours & Training

California Native Plant Society members reviewed the Lockeford PMC program and were impressed by the number of native plants being studied and released by NRCS. During 2004, more than 25 presentations and tours were given, including new employee groups. Contact PMC Manager Dave Dyer at (209) 727-5319 to schedule a tour group to visit the PMC.

Educational events such as NRCS Orientation For New Employees (ONE) training (above) and PMC field day activities are regularly held at the Center.

Field Plantings

Field plantings are used to ensure particular plants are suitable to the site and conditions. Each year, seed is purchased for Field Office use. The majority of seeds purchased are California natives, but the Plant Materials Program also has introduced species available. The Field Planting program allows the PMC to gain a better understanding of seeding rates, establishment and maintenance of native plants. This information will be used to update the vegetative guides.

Twenty field plantings were established during FY2004. The field plantings addressed many resource problems and helped Field Offices determine the best plants for various practices. Most of the field plantings consisted of native plants. Some of the field planting purposes were for range, weed control, erosion control, wildlife restoration/nesting, and bank stabilization. Be aware that appropriate lead time is necessary to request shrubs to be propagated, so they will be ready in the fall. As with any field planting, a PM-9 Field Planting Request Form must be submitted.

Service Area

The land served by the PMC covers 70 percent of California's 100 million acres. The private land is comprised of diverse topography consisting of broad valleys, rolling foothills, upland plateaus and rugged mountains. Two distinct climates—the Mediterranean and Continental—combined with 1,300 soils, produce many complex growth areas that are served by the Lockeford PMC.

Group from Chile reviewing California native plants used in hedgerows and buffer strips. The group was interested in using plants to control and intercept nitrogen runoff from agriculture fields.

Plant Materials Program Web Site

If you are looking for information on vegetative solutions to conservation problems or would like copies of the Lockeford PMC Technical Notes, please go to the Plant Materials Program Web site at http://Plant-Materials.nrcs.usda.gov.