United States Department of Agriculture

NRCS Natural Resources Conservation Service

2009

Golden Meadow Plant Materials Center

Progress Report of Activities

Issued December 2009

438 Airport Rd., Galliano, LA 70354, Tel: 985-475-5280, Fax: 985-475-5280, Web site: Plant-Materials.nrcs.usda.gov

Golden Meadow Plant Materials Center

Who We Are

The Golden Meadow Plant Materials Center (PMC) selects conservation plants and develops innovative planting technology to solve the nation's most important resource concerns. Our mission is to develop, test, and transfer effective state-of-the art plant science technology to meet customer and resource needs.

The USDA, Natural Resource Conservation Service Golden Meadow PMC was founded in the early 90's on 90 acres of land, which was established to provide a solution to aid in the ongoing battle of coastal restoration. The PMC conducts many technical research strategies to better understand how different plant species are able to thrive and reproduce in the coastal marshes. The PMC also provides crucial information on coastal marsh plants to the community in the promotion of taking a stand towards coastal restoration.

Program Emphasis

The activities of the Golden Meadow PMC are guided by a long-range plan. The priority work areas are:

- Plant Materials for Marsh Revegetation
- Plant Establishment Techniques
- Seed Technology for Selected Wetland Species
- Technology Development and Transfer
- Special Projects
    1. Submerged Aquatic Vegetation
    2. Water Quality Studies
    3. Bioengineering

This report highlights the major activities at the PMC during 2009. For more detailed information, contact the Golden Meadow PMC or the Louisiana Plant Materials Specialist.

Submersed Aquatic Vegetation Propagation and Planting Techniques for Restoration in Coastal Louisiana

In cooperation with Barataria Terrebonne National Estuary Program, the Golden Meadow PMC is conducting a study to develop technology to grow and plant submersed aquatic plants. The focus of the study is to collect *Vallisneria americana* and *Ruppia maritima* from local native sources and propagate for commercial production. The PMC will develop techniques to grow these plants in a manner suitable to commercial growers and test several techniques of planting in the wild. Points to be tested will be plants grown under various shading regimes to determine vigor and algae control, chemical shading and weed control. Substrates will be tested to determine suitability for nursery growth and transplant efficacy. These include various mats (e.g. coconut fiber) and simple cloth bags. If successful we hope to be able to provide information to producers and contractors on means of successfully providing further protection for the shallow open waters of our coast line.

Harvested vallisneria plants used for study

Adaptability for potential use of Sunn Hemp

Sunn hemp (Crotalaria juncea) is a tropical or sub-tropical plant that acts like a summer annual when grown in the continental United States. Sunn hemp's adaptation to a wide range of soils and superior performance on poor sandy soils has attracted attention. Sunn hemp also produces high organic matter yields while fixing large amounts of nitrogen in the soil. This study attempts to determine the potential use of sunn hemp for green manure and cover crop throughout the country.

'Tropic Sun' sun hemp 90 day clipping

As a cover crop, sunn hemp can produce 5,000-6,000 pounds of biomass per acre in southern climates in 60-90 days. It also can produce 120-140 pounds of nitrogen in the same amount of time.

The Golden Meadow PMC planted sunn hemp, using a Hedge precision row planter June 2009. Clippings were collected in 30 day intervals ending at 90 days. A half meter squared quadrate was used to make 3 random clippings from predetermined blocks. These clippings were bagged, numbered, and a wet weight was recorded. The bags were placed in the drier for a 24-48 hour period and then weighed again to obtain a dry weight. Data is still being collected and will be continued until plants die due to the frost. The sunn hemp is being experimented to determine how late the plant can be grown and still produce a viable seed.

Evaluation of Salt Tolerance in California Bulrush

California bulrush *(Schoenoplectus californicus)* has proven effective as a wave barrier for shoreline protection and stabilization. This native freshwater emergent plant is also important for stabilizing and restoring disturbed or degraded wetland areas, and for wildlife food and cover. There is a need for a tested and a proven cultivar for conservation use in coastal Louisiana. Native populations were identified and vegetative propagules were collected throughout coastal Louisiana in 1999. Forty-nine collections have been vegetatively propagated and increased for performance on and off center testing.

In 2008, the Golden Meadow PMC made a release of California bulrush, Bayou Lafourche Germplasm, for fresh to intermediate saline marshes.

Further work with California Bulrush is ongoing with the Louisiana State University, AgCenter Rice Research Station to identify strains of Bulrush that exhibit salt tolerance. The work attempts to identify DNA markers associated with salt tolerance and verified with field testing.

Louisiana Native Plant Initiative

The Louisiana Native Plant Initiative is a cooperative effort between the USDA Natural Resources Conservation Service, Coastal Plain Conservancy, McNeese State University, USGS National Wetlands Research Center, Nicholls State University and the Barataria Terrebonne National Estuary Program to help conserve a vanishing natural resource in Louisiana--native plants. Public and private land managers around the state have a growing interest to use locally adapted native plant materials for restoration, conservation, and re-vegetation projects. Working groups within the initiative will identify resource areas, develop species lists for seed collections, establish seed increase sites, develop relationships to promote commercial production of native plants, and develop partnerships to establish future funding needs.

The collection, assembly, selection and release of new plant varieties are integral parts of the Louisiana Native Plant Initiative (LNPI). The LNPI will utilize procedures and guidelines from the USDA-NRCS National Plant Materials Manual (3rd edition, 2000). The NRCS Plant Materials Program relies on the cooperation, standards, and regulations of other state and federal agencies during the development of plant releases. The Association of Official Seed Certifying Agencies (AOSCA) develops the basic requirements for crop production and defines the various classes of releases, requirements for each class of release and labeling requirements. The LNPI will also work closely with the Louisiana Department of Agriculture and Forestry to establish standards for new crop production and insuring source of seed stock, genetic purity, isolation requirements, rouging other crop or weed contaminants, field inspection, seed cleaning and seed quality, purity and germination

Recurrent Phenotypic Selection for Intrapopulation improvement of a Cross-Pollinated Perennial cultivar with Improved Seed Production of *Spartina spartinae*

Gulf cordgrass *(Spartina spartinae*) is being evaluated for the potential release of a named cultivar. Thirty-two accessions have been established in a crossing block, at the Golden Meadow PMC, for phenotypic evaluations. Seeds harvested and germinated will be tested and performance evaluated relative to its range of adaptation, soils and other environmental factors.

Dedicated dredge sediment, marsh, and ridge habitat

The primary goal of this study is to develop baseline information on environmental parameters affecting the selection, establishment, and growth of plant species for dredge-restored sites. Objectives of the study are: to initiate steps which reduce the time required for the establishment of productive plant communities on dredge materials; to develop methods to re-vegetate and manage dredge materials that will support increased plant species; to provide planners, designers and builders with management strategies that incorporate an ecological and environmental perspective into dredge material engineering.

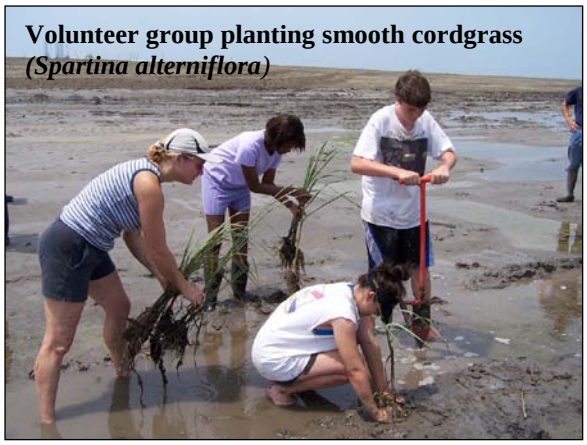
Various field plantings have been established in cooperation with the LSU AgCenter and the Greater Lafourche Port Commission on a 230 acre dredge-restored site at Port Fourchon, Louisiana. Evaluation plantings have been established to study:

- aerial seeding techniques for the establishment of smooth cordgrass (*Spartina alterniflora*),
- vegetative establishment of black mangrove (*Avicennia germinans*) in relation to elevation
- planting and performance of selected tree and shrub species
- planting and evaluation of salt tolerant wheat strains as a potential cover crop
- planting and evaluation of selected native plant materials for use on areas where vegetation has not colonized naturally.

When completed, this study will significantly contribute to the knowledge base available to a broad spectrum of coastal wetland users. It will develop plant technology applicable to coastal restoration, improved wildlife habitat and increased productivity of Louisiana's coastal wetlands.

Woody Plant Selection for Conservation, Restoration, and Neotropical Habitat Enhancement for Louisiana's Marshes

The PMC began an initiative to identify native woody plant species suitable for coastal restoration and remediation activities. The overall goal is to implement a program to develop woody plant species technology; to provide plant species information to coastal wetland managers; and to



Volunteer group planting smooth cordgrass *(Spartina alterniflora)*

demonstrate methods for improving plant species diversity and improve wildlife habitat.
Seeds of ten species identified by the Barataria-Terrebonne Estuary Program Action Plan Committee were collected from native populations found growing in coastal Louisiana. The species were planted to determine adaptation and performance on a barrier island, dedicated sediment disposal site, brackish marsh, protected bay, and the Plant Materials Center.

Species selected for evaluation include:

- Hackberry (*Celtis laevigata*)
- Live oak (*Quercus virginiana*)
- Wax myrtle (*Morella cerifera*)
- Hercules-club (*Zanthoxylum clava-herculis*)
- Red mulberry (*Morus rubra*)
- Yaupon (*Ilex vomitoria*)
- American beautyberry (*Callicarpa americana*)
- Sweet acacia (*Acacia farnesiana*)
- Honeylocust (*Gleditsia triacanthos*)
- Persimmon (*Diospyros virginiana*)

Evaluation of Panicum virgatum for coastal Louisiana marshes and pastures

Switchgrass *(Panicum virgatum)* is an important native prairie species which is found growing throughout coastal marshes of Louisiana. Several ecotypes have been found growing in saline and brackish marshes mainly on ridges and at higher marsh elevations. Samples taken from specimen plants found in these areas are being vegetatively increased for assembly for future evaluation and potential use in coastal conservation.

Screening for Tolerance on Saturated Soil Conditions for Cane Grown for Sugar and Biofuel Production

USDA/ARS Sugarcane Research Unit, Houma, LA is conducting field experiments at the Golden Meadow PMC to identify commercial sugarcane and energy cane varieties that exhibit tolerance to periodic saturated soil conditions under Louisiana growing conditions on Rita muck soils.

Golden Meadow Plant Materials Center Releases

- 'Vermilion' smooth cordgrass (*Spartina alterniflora*)
- Brazoria Germplasm seashore paspalum (*Paspalum vaginatum*)
- Pelican black Germplasm mangrove (*Avicennia germinans*)
- Fourchon Germplasm bitter panicum (*Panicum amarum*)
- Caminada Germplasm seaoats (*Uniola paniculata*)
- 'Gulf Coast' marshhay cordgrass (*Spartina patens*)
- Timbalier Germplasm gulf bluestem (*Schizachyrium maritimum)*
- Bayou Lafourche Germplasm california bulrush (*Schoenoplectus californicus)*

Technology Transfer – New Publications

A number of new or revised publications were completed during the past year – a few are mentioned below:

Technical Notes

- Tech Note 10 Understanding Seed Certification and Seed Labels
- Tech Note 11 Understanding Seeding Rate, Recommended Planting Rates, and Pure Live Seed
- Tech Note 12 Calculating Seed Mixtures - Steps to Guide You in Developing Conservation Seed Mixtures.
- Tech Note 13 Planning Site and Seedbed Preparation for Cropland Conversion to Native Species
- Tech Note 14 Conservation Planting Methods for Native and Introduced Species
- Tech Note 15 Coastal Wetland Plant Vendors for Louisiana

Field Office Technical Guide

- Job sheet 327 Conservation Cover
- Job sheet 332 Contour Buffer Strip
- Job sheet 342 Critical Area Planting
- Job sheet 386 Field Border
- Job sheet 393 Filter Strip
- Job sheet 601 Vegetative Barrier
- Louisiana Seeding Rate Tables

Plant Fact Sheets and Brochures

- Bahiagrass Plant Fact Sheet
- Black Mangrove Plant Fact Sheet
- Sugarberry Plant Fact Sheet
- Caminada Seaoats Brochure

Visiting Groups

- La. Economic Development
- Leadership of Lafourche
- National Science Organization
- International Student Group
- Harvard University Students
- Farm Bureau Youth Conference
- Montegut Middle School
- Larose Cut Off Middle School
- Project Pelican Student Group
- Bayou Lafourche Red Hat Club
- Louisiana Department of Wildlife and Fisheries/BTNEP Teachers Wetshop
- BTNEP Chicago Group
- BTNEP Seattle Group
- Local 4-H groups

Website

All Golden Meadow PMC publications can be downloaded from the following web-sites:
http://plant-materials.nrcs.usda.gov/lapmc/publications.html
http://www.la.nrcs.usda.gov/technical/PM/index.html
http://plant-materials.nrcs.usda.gov/lapmc/
