

**Golden Meadow Plant Materials Center
Progress Report of Activities
2010**

Issued January 2011

438 Airport Rd., Galliano, LA 70354, Telephone: 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 incessant battle of coastal restoration. The PMC conducts numerous technical research strategies to better understand how different plant species are able to thrive and reproduce in the coastal marshes. The PMC also provides pertinent 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 calendar year 2010. For more detailed information, contact the Golden Meadow PMC or the Louisiana Plant Materials Specialist.

CURRENT STUDIES

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. Parameters 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 biodegradable 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.

To prepare for Phase I of II of the study, samples were collected and placed in 300 gallon containers filled with water. Potting medium consisted of 75% fine sand and 25% of an even mixture of peat moss and pine bark. Two containers were used which consisted of plastic containers and small burlap sacks. Shading consisted of 63% shade, simulated by mesh cloth stretched out on top of container, and a no shade treatment. There were/are six - 300 gallon containers and 50% of each container consisted of the container grown planting method and the other 50% of the container consisted of the burlap sack planting method. Three - 300 gallon containers were shaded (63%), where as the other three received the no shade treatment. The study is currently active and is conducted at the PMC in one of the larger greenhouses.

The study is currently in Phase II (Field Deployment). Phase II commenced in early July of 2010 and was accomplished by boat to two sites of southeast Louisiana's waters. The following data was taken at each respective site:

Site 1 - Water pH - 6.89, Air Temperature - 27.7°C, O₂ % - 10%, Salinity - 1.3ppm

Site 2 - Water pH - 6.96, Air Temperature - 28.4°C, O₂ % - 34%, Salinity - 2.7ppm

Throughout the months of July and September, 2010, biomass measurements, heights, active buds and wet weights were recorded then placed in drier. Masses of roots were obtained thereafter. Near summer's end, field observations again were taken to conclude that many of both site's plants did not survive probably due to large mats of water lilies and giant salvania which infested the areas.

Thus far, according to greenhouse observations, it appears as if though the shading (63% cover) has resulted in increased vegetative growth (leaf lengths), whereas the plot with no shade resulted in plants possessing healthier root growth. No visual vegetative differences have been determined for either planting method (container grown vs. burlap sack). Observations will continue with attempts to acquire reliable data for growers on logistical processes to increase production of *Vallisneria americana*.



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. Future release is expected once field testing has been completed.

Louisiana Native Plant Initiative

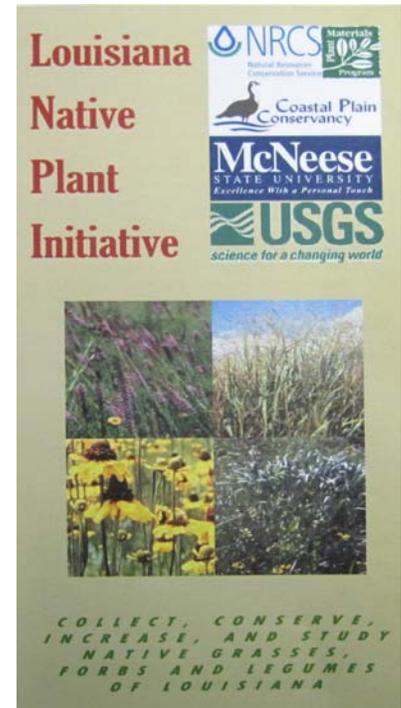
The Louisiana Native Plant Initiative was established as a partnership effort to collect, preserve, increase, and study native plants in the state. Seeds and plants of native species developed by the partnership will be released to commercial growers for production, and eventual sale to the public. Currently, LNPI is comprised of 22 federal, state, and non-governmental organization partners. Over the past six years five evaluation and production locations including the USDA-NRCS Plant Materials Centers at Galliano, LA (GMPMC) and Nacogdoches, TX (ETPMC), Nicholls State University Farm at Thibodaux, LA, McNeese State University Farm at Lake Charles, LA, and University of Louisiana at Lafayette - Center for Ecology and Environmental Technology (CEET) have been established and are working together to select and increase seeds and plants of Louisiana ecotypes. Since its inception the LNPI partnership has collected over 60 individual species and over 400 individual collections of native plants from critical habitats within Louisiana.

The collection, assembly, evaluation and release of new plant varieties are integral parts of the Louisiana Native Plant Initiative (LNPI). The Golden Meadow Plant Materials Center has taken the lead in developing the protocols and procedures necessary for the collection, evaluation and seed increase of native species targeted through LNPI. Currently, initial seed increase procedures of Ashy Sunflower (*Helianthus mollis*) and several other native species are currently being developed that will guide cooperators at the production locations.

The Golden Meadow Plant Materials Center has taken the lead in developing the protocol and procedures necessary for the initial seed increase of Ashy Sunflower (*Helianthus mollis*) in addition to several other native species associated with LNPI. Procedures are currently being developed and are dependent upon the inventory that our cooperators possess. The Center will soon have the standard needed for initial seed increase of the respective species to keep all of our partners in cognition about the procedures needed to carry out this task.

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.

Golden Meadow Plant Materials Center works with local Lafourche Parish Levee District

The South Lafourche Hurricane Protection Levee is in the process of constructing new levees and raising the effective height of existing levees to provide protection to the area. Mechanical manipulations of the slopes of the newly constructed levees leave the Earth bare and vulnerable to rapid soil erosion.

This study targets the identified need by the Levee District to find cost effective solutions to establish and restore vegetative cover to existing and newly constructed levees. Factors that will be considered include, but are not limited to: the evaluation of species useful for the re-vegetation of levee, the evaluation of planting techniques and bioengineering practices helpful in restoring cover, evaluation of soil enhancement techniques to reduce compaction and improve soil health, and the development of publications and guidelines.

Two study sites will be identified to evaluate species and techniques needed to establish and maintain the vegetative cover on levee systems: Site 1 – Compacted heavy soils, Site 2 – Compacted sandier soils



Vegetative species and species/mixed included in the study were Bahiagrass (Pensacola, Argentine, TifQuik and Tifton 9), Bermudagrass (Sahara, Pasto Rico), Bermuda/Bahiagrass blends (Seed), Bermuda/Bahiagrass blends with cover crop – Fall/Winter blends (bermudagrass, bahiagrass with annual ryegrass) & Spring/Summer blends (bermudagrass, bahiagrass with browntop millet), Marshhay cordgrass (Gulf Coast), Seashore Paspalum (Seed), Switchgrass (Seed – Alamo (lower toe only), and others as identified.)

Evaluation of planting techniques and bioengineering practices (one at each site). To evaluate the success of using various planting techniques as they relate to specific plant material. Techniques will include: No-till drill, Brillion Seeding, Hydroseeding, and Improved broadcast methods.

Evaluation of soil enhancement techniques to reduce compaction and improve soil health. Amendments used consist of the following: Fertilizer amendments, Sprays, and Mycorrhizal fungi.

Following installation and evaluations all information will be used to develop and provide guidelines for the establishment, evaluation and maintenance of vegetative cover on hurricane protection levees.

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.



In 2009 staff has successfully established a switchgrass crossing block at the PMC. Seed heads were harvested for the first time on this block in the fall of 2010. We are currently thrashing and cleaning the seed collected which will be used for plant selections. All environmental factors will be considered in the determination of where the seed plots will be located, tested and performance evaluated.

Evaluation 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.

CURRENT ACTIVITIES

Golden Meadow Plant Materials Center assists Nicholls State University

Saturday, November 6th, 2010 the Golden Meadow Plant Material Center worked in conjunction with Nicholls State University to establish vegetation on Louisiana's rapidly diminishing coastline. Planting was performed on the shorelines of Elmer's Island located in the southeast portion of the state. Vegetative establishment consisted of approximately 3000 'Gulf Coast' Marshhay Cordgrass (*Spartina patens*), 1000 Fourchon Bitter Panicum (*Panicum amarum*) and 600 Timbalier Gulf Bluestem (*Schizachyrium maritimum*). These respective species are all native plants to Louisiana and are effective in coastal restoration. Planting methods included multiple strip plantings at 15 to 18 inch spacing between species. Hand and mechanical methods of planting were used to establish vegetation along side pre-existing sand fences and along the pre-established shoreline sand dunes. Stand counts and plant survival will be monitored in the spring of 2011.



Golden Meadow Plant Materials Center teams up with CWPPRA

Recently, staff at the Golden Meadow Plant Materials Center and personnel including Resource Conservationists and Coastal Vegetative Specialists involved in the Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) teamed up to spend the day in the marshes of southeast Louisiana. NRCS engineers, biologists and soil scientists have designed and helped construct rock levees in many areas of the marshes of south Louisiana to assist in marsh creation. High and low tides possess lots of energy and sediment exchange



across these rock levees and belief is over time if sufficient sediment could accumulate, then the possibility of establishing vegetation between the rocks could become a reality and could aid in the stability of the rock levees, decreasing long term subsidence. We visited four sites where high energy exchange was evident and set up four test sites to be monitored in the spring of 2011. The four sites established consisted of a variety of vegetation in addition to multiple planting methods. These will serve as initial trials to see if rock levee systems ultimately are capable of supporting native vegetation.

Golden Meadow Plant Materials Center assists local graduate student

Curt J. Riche', newly assigned Assistant Manager at the Golden Meadow Plant Materials Center assisted Yi Wang, graduate student at Louisiana State University, Baton Rouge, LA in an attempt to collect *Spartina alterniflora* ('Vermillion' Smooth Cordgrass) for graduate research studies. By late November, the *Spartina alterniflora* began to shatter in the south eastern marshes of Louisiana and the seed collection was a success. The fourteen day viability test indicated over 95% of the seeds was viable. Assistance to the coastal research studies needed by these graduate students and professors will continuously increase and be provided by the Golden Meadow Plant Materials Center.



Black Mangrove Harvest 2010

Black Mangrove harvest was a success although the seed was less plentiful this year. Growers have received their allotments and germination is actively taking place at the center. The PMC just recently purchased a germinator to aid in the germination process. The germinator is set at approximately 25 degrees Celcius and resulting in rapid germination. Thus far, the viability of the Black Mangrove seed harvest of 2010 has resulted in prolific germination. Newly germinated seed will soon be transplanted to larger containers and placed in greenhouse for future distributions.



INFORMATION AND REPORTS

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 15 Coastal Wetland Plant Vendors
- Tech Note 16 Container Grown Wetland Plants
- Tech Note 17 Vegetative Wetland Plants

Other Publications

- LAPMC Information Booklet
- 2009 Annual Technical Report
- 2009 Progress Report of Activities
- Submersed Aquatic Vegetation Propagation and Planting Techniques for Restoration in Coastal Louisiana
- Appendix 1 – Planting Rates for Louisiana by MLRA's

Tours and Presentations

- Voice of the Wetlands Festival
- Grand Isle High School
- Coastal Marsh Field Day
- USDA Executive Tour and Presentation
- Chamber of Commerce Presentation
- Bayou Group Tour and Presentation
- Larose Middle School Tour and Presentation
- Red Hat Club Tour
- State of the Coast Conference
- LaFete D'Ecologie
- Pelican Project Tour
- Regional Conservationist Coastal Louisiana Tour and Presentation



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/>

Golden Meadow Plant Materials Center Staff

Just recently, the Golden Meadow Plant Material Center has undergone substantial re-assignments and has filled needed positions. From left to right in the picture below you can familiarize yourself with the new names, faces and positions that make up the staff of the current Plant Materials Center.

Garret Thomassie – Manager
garret.thomassie@la.usda.gov

Curt J. Riche’ – Assistant Manager
curt.riche@la.usda.gov

Mark Felarise – Biological Science Technician
mark.felarise@la.usda.gov

Lee Harwell – Biological Science Aid
lee.harwell@la.usda.gov

Alexis Luke – Program Clerk
alexis.luke@la.usda.gov



HAPPY NEW YEAR FROM THE STAFF AT THE GOLDEN MEADOW PLANT MATERIALS CENTER

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.