



2013 Progress Report of Activities

Golden Meadow Plant Materials Center

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This report highlights the major activities at the Golden Meadow Plant Materials Center during calendar year 2013. For more detailed information, contact the Golden Meadow PMC Manager at 985.475.5280.

CURRENT STUDIES

Chitimacha Indian River Cane Evaluation



Left to Right: Sophe Kilchrist, Juanita Clements, Patra Gherich, and Kim Walden

Since 2001, the PMC has been working with tribal representatives on propagation, establishment, culture and harvest of river cane (also known as wild cane, giant cane and giant bamboo). The conservation problem in this case is that the Chitimacha's craft is threatened by a shortage of river cane populations. Additionally, there were no river cane populations actually growing on the reservation, which has diminished to ¼ of its established area in the mid-1800s.

The conservation and preservation of an ancient cultural tradition motivated the Chitimacha Tribe of Louisiana in their request for PMC assistance. They are the oldest recognized and indigenous tribe in Louisiana. They have used river cane (*Arundinaria gigantea*) to construct woven baskets and mats since the era of the Mississippi mound-building culture, a tradition dating back to the Middle Ages.

The PMC has continued to work with the Chitimacha Tribe to increase river cane populations; notable to new expanding tribal land areas. Continuing efforts in order to take the guesswork out of the “where, when and how” will be put forth by the PMC in years to come to insure the tribe will have adequate supplies of river cane for future generations to come.

This year the PMC staff with the help of St. Mary Soil & Water Conservation District, Farm Service Agency and members of the Tribe were able to excavate approximately 225 individual river cane shoots that were then transplanted in suitable areas on the reservation. Six to eight individual shoots of river cane were placed in each hole to increase the chances of survival for the area. They were placed in partial shaded areas on elevated dikes. Previous years plantings revealed the river cane performed best in these areas as opposed to lower lying areas with regards to soil type. Annual increasing of river cane on the reservation should provide ample supply of river cane in order for the tribe to carry out and continue its historic cultural basket weaving tradition. Each year the PMC lends its tools, labor and technical expertise to make this event a success.



Photo of newly transplanted river cane

Evaluating Cultural Techniques for Propagating Black Mangrove for Commercial Production

Traditionally Pelican Germplasm black mangrove (*Avicennia germinans*), a release from the Golden Meadow Plant Materials Center, has been propagated commercially by seed. High cost needed to heat greenhouses for seed propagation and/or other propagation areas has reduced the number of plant producers and increased the plant cost. Finding a cost and time efficient method to propagate black mangrove using asexual methods will help increase grower interest and increase commercial production of black mangrove.

The purpose of the study was to evaluate which vegetative method would yield better survival results for commercial propagation of the Pelican Germplasm black mangrove. Finding the most time efficient and economically feasible method that benefits the commercial growers' efforts to propagate successfully, and able to propagate black mangrove year round rather than growing out seed once in a year.



Photo of Black Mangrove cuttings in germination flat

Plant cuttings from 5 year old black mangroves grown in greenhouses were used to provide the 3 types of plant cuttings needed for this study. Cuttings were taken from the youngest (juvenile tissue) labeled 1st year, semi-woody labeled 2nd year and woody stem (greater than 4 years) labeled mature. All stem cutting types were subjected to four types of treatments. 3 different strengths of rooting hormone (Dip'N Grow) were used to determine which chemical application would be more productive in promoting root development. Rooting hormone solutions consisted of a mixture of 1:5 (T-1), 1:10 (T-2) and 1:20 (T-3) parts to water solution. There was also a control, to which no rooting hormone was

applied. The 3 types of cuttings were then labeled and planted in germination trays using ProMix with Bio fungicide. A Random Sequence Generator numbers program was used to determine the order for each of the 12 samples to be evaluated on a weekly basis for 10 weeks. The study was conducted in a temperature controlled green house and received adequate watering throughout the study. Observations were taken every seven days over a ten week period.

Although all 4 treatments did produce roots and shoots, visual results observed that the first year stem cuttings treated with a T-2 solution outperformed the rest. Intermediate results were recorded for mature stem cuttings treated using a T-1 solution. Poorest results were observed from second year stem cuttings. Stem cuttings from second year growth yielded few results and some of the cuttings had decayed in the tray before initial rooting results were observed.

In conclusion, this study proved for a successful vegetative propagation using first year stem cuttings that were treated with a 1part Dip N' Grow rooting hormone to 10 parts of water, shows the highest percent rooting for commercial production. Additional cutting trials, including statistical analysis, will be made to confirm results.

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 of Louisiana. Currently, LNPI is comprised of federal, state, and non-governmental organization partners. Since its inception, the LNPI partnership has collected over 400 individual collections of native plants from critical habitats within Louisiana. Seeds and plants of native species developed by the partnership will be released to commercial growers for increase production and eventually be available for public retail.

LNPI has six locations including the USDA-NRCS Plant Materials Centers at Galliano, LA (GMPMC), Nacogdoches, TX (ETPMC), Nicholls State University Farm at Thibodaux, LA (NSU), McNeese State University Farm at Lake Charles, LA (LERC), University of Louisiana at Lafayette - Center for Ecology and Environmental Technology (CEET), and Kisatchie National Forest – Stuart Seed Orchard have been working together to select and increase seeds and plants of Louisiana ecotypes.

In 2013, many different species of native forbs and grasses including Texas coneflower, Indiangrass and Eastern gammagrass are being evaluated for potential future releases through the LNPI program.

ETPMC harvested 2.2 pounds of Cajun sunrise germplasm (*Helianthus mollis*) seed from 2013 crop. On average, this year's collection yielded 149,984 seed per pound. Seed fill was at 100 percent and average percent germination was as follows: Stratified seed 77 percent; Non-stratified seed 47 percent. Stratified seed exhibited the highest average germination at 7 days. Non-stratified seed exhibited the highest average germination at 7 and 14 days. Temperatures in the germination chambers ranged from 59 to 86 degrees Fahrenheit with 8 hours of light. Site at NSU harvested 3.5 pounds of Cajun sunrise germplasm and predict similar germination test result when completed.

An assembly of Eastern gammagrass (*Tripsacum dactyloides*) plant collections made from endemic populations found throughout southeast Louisiana have been established to a breeders block at NSU. Seed yields have been average, but seed quality is low. There was a noticeably spike in the overall plant vigor of the Eastern gammagrass. An isolated F1 seed increase block was started in 2011 and further increase has continued thru 2013.

Approximately 300 Texas coneflower (*Rudbeckia texana*) plants were transplanted to existing seed increase block at NSU to increase seed production. Evaluations for future release of Texas coneflower are being determined in anticipation to have available to commercial producers.

For the CEET location, Eastern gammagrass (*Tripsacum dactyloides*), indiangrass (*Sorghastrum nutans*) and little bluestem (*Schizachyrium scoparium*) have been harvested with average seed yields. Each of these seed increase plots are being expanded by several rows. There was a noticeable spike in the overall plant vigor of the Eastern gammagrass. Switchgrass (*Panicum virgatum*), big bluestem (*Andropogon gerardii*), Florida paspalum (*Paspalum floridanum*) and gulf coast muly Grass (*Muhlenbergia capillaries*) all produced average seed harvests.

The species found in the table below are being expanded in seed increase blocks at CEET. Data in the right hand portion of the table represents weight of seed harvested for the 2013 growing season. Collected seed is currently being cleaned, processed and stored at CEET. All species are native to the coastal prairie and are being evaluated for growth performance and seed production.

CEET HARVEST DATA

Scientific Name	Common Name	Weight (lbs)
<i>Panicum virgatum</i>	Switchgrass	4.92
<i>Paspalum floridanum</i>	Florida Paspalum	0.03
<i>Sorghastrum nutans</i>	Indiangrass	2.11
<i>Baptisia alba</i>	Wild-White Indigo	0.02
<i>Rudbeckia grandiflora</i>	Rough Coneflower	0.05
<i>Rudbeckia texana</i>	Shiny Coneflower	26.70
<i>Manfreda virginica</i>	American Aloe Agave	0.15
<i>Lespedeza capitata</i>	Roundhead Bushclover	0.01
<i>Hibiscus lasiocarpus</i>	Wooly Rose Mallow	0.61
<i>Silphium laciniatum</i>	Compass Plant	0.09
	Lanceleaf	
<i>Gaillardia aestivalis</i>	Blanketflower	0.19

Evaluation of Sand Live Oaks for Re-Establishment along Louisiana Gulf Coast

Over the years, hurricanes and other storm events have damaged or diminished sand live oaks along the Louisiana gulf coast. A species commonly known as sand live oak (*Quercus geminata*) is currently being studied for potential re-establishment along Louisiana coastal beaches. Because sand live oak exhibits many morphological characteristics similar to those of the live oak (*Quercus virginiana*), it grows in sandy, scrub habitat and does not reach the immense dimensions of the live oak. Sand live oaks are found along the coastal plain of Louisiana east to North Carolina and south throughout most of Florida's peninsula. Sand live oak grows best in partial shade to full sun and generally reaches heights of 50 feet, but has been documented as reaching heights as tall as 95 feet. Sand live oaks are highly resistant to wind. The thick, leathery leaves are simple and alternate and range from 1½ to 2½ inches long. They are elliptical in shape with coarse veins that are deeply pressed into the leaf surface, and they have smooth margins that are, in many cases, highly revolute or inwardly curling. The upper surface of the leaf is dark green and the underside is a dull gray to almost whitish color with sparse to copious pubescence or hairs. The presence of this leaf pubescence, along with the upper surface venation, can aid in distinguishing sand live oak from live oak. The twigs also will have some pubescence when they are immature. The bark is rough to the touch, dark brown, and deeply furrowed. Acorns range from 5/8 to 1 inch long with 1/3 of the dark brown, egg-shaped nut enclosed in a scaly, whitish gray cup. Acorns are produced annually and appear in groups of 1 to 3 in the fall. The sand live oak's annual production of acorns provides many species of wildlife with a food source.

In early summer the Golden Meadow PMC staff, in addition to Bayou Land Resource Conservation and Development (RC&D), and other Earth Team volunteers transplanted approximately 300 sand live oak trees on designated areas throughout Grand Isle State Park in Louisiana. Blue-X® tree shelters were installed to help accelerate growth, enhance seedling survival and reduce herbivore damage. Trees were monitored in late November to determine a survival rate of 90%. Trees appeared to be very healthy while approximately 30% also showed vigorous growth. Several hundred sand live oak acorns were again collected and propagated this year for the 2014 plantings along areas of Grand Terre Island, Port Fourchon, Grand Isle State Park and other areas in Louisiana affected by past hurricanes and tropical systems.



Photo of newly transplanted Sand Live Oak



Photo of Sand Live Oak with Blue-X tree shelter

PARTNERSHIPS WITH NRCS AND OTHER AGENCIES

Screening for Tolerance to Periodic Flooding for Cane Grown for Sucrose and Bioenergy

The PMC currently is assisting the USDA/ARS Sugarcane Research Unit, Houma, LA with new and improved cultural practices for sustainable sugarcane production and environmental protection. To prevent negative impacts on food production, energy crops in LA will have to be grown on marginal lands, that in some cases, may be prone to flooding. Due to the PMC's capability to flood and drain plots mechanically, a study was initiated to compare the flood tolerance of energycane and sugarcane. To sustainably produce sugar under periodic flooding, an extensive screening of the collection of parental material being used in the Louisiana sugarcane varietal development program is needed to determine if genes for flood tolerance exists locally or if other sources of these genes are needed. In Louisiana, where sugar production is not economically sustainable with existing low fiber/high sugar sugarcane clones, an alternative to the development of flood tolerant sugarcane would be to utilize energycanes for production of cellulosic biomass in areas prone to flooded conditions because existing energycane clones are tolerant to periodic flooding.

Raccoon Island Vegetative Planting Project

The Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) is federal legislation enacted in 1990 that is designed to identify, prepare and fund construction projects with regards to coastal wetland restoration. Since CWPPRA's inception, 151 coastal protection or restoration projects have been authorized. These projects have benefited over 110,000 acres in Louisiana. This legislation was approved by the U.S. Congress and signed into law by former President George H. W. Bush.

CWPPRA scientists, engineers and project managers use a variety of techniques to protect, restore or enhance wetlands. Each restoration project is unique and may use one or more techniques to repair delicate wetlands. The following techniques include:

- Marsh creation and restoration
- Shoreline protection
- Hydrologic restoration
- Beneficial use of dredged material
- Terracing
- Sediment trapping
- Vegetative planting
- Barrier island restoration
- Bank stabilization

The Golden Meadow PMC has assisted in CWPPRA vegetative planting projects by serving as an inspector for the Raccoon Island Vegetative Planting Project. Approximately 10,000 'Vermilion' smooth cordgrass were planted on this island, which lies approximately 15 miles south of Louisiana's coast. This barrier island is in an area ideal for the nesting of pelicans and other shore birds. Eroded and washed away areas of the island were restored using hydraulically dredged material and then allowed to de-water creating approximately 60 acres of land. The newly deposited sediment needed protection from potential erosion so the project called for vegetative plantings. Smooth cordgrass was chosen because it is a highly salt tolerant species which is endemic to the area.



Photo of 'Vermilion' Smooth cordgrass planting on Raccoon Island

Each vegetative planting project is different and distinctly unique. Since the majority of contracts require cultivars and/or germplasm released by the Golden Meadow PMC, it is beneficial for PMC staff to be onsite when some of these plantings take place. Because of several factors that can affect plant growth, such as soil conditions, fertilization, depth of planting and spacing, PMC staff can address potential problematic issues rather quickly and advise the best methods to keep the plantings successful. As questions arise and if problems are encountered, PMC staff can become aware of them and try to further develop innovative technical ways to resolve unforeseen issues.

2013 ACTIVITIES

Assisting Louisiana State University - Department of Plant Pathology and Crop Physiology

'Vermilion' Smooth Cordgrass (*Spartina alterniflora*), a vegetative plant released by the Golden Meadow PMC, plays a vital role in coastal restoration. Although smooth cordgrass produces an abundant amount of seed each year, the viability of the seed is quite low. *S. alterniflora* produce seeds that are recalcitrant or also known as unorthodox seed, which means the seed is difficult to store and cannot survive desiccation therefore dies when it is dried. Researchers at Louisiana State University are researching *S. alterniflora* to explain seed recalcitrance, seed dormancy release by cold stratification, and the effect of drying temperature and drying rate on the critical water content. The Golden Meadow PMC has been involved in efforts to assist Dr. Marc Cohn and Yi Wang (Department of Plant Pathology and Crop Physiology, Louisiana State University Agricultural Center, Baton Rouge, LA) in the survey, transportation and harvesting of viable common smooth cordgrass seed. Finding techniques for long-term storage of recalcitrant seed will significantly improve commercial production and plant recommendations for coastal restoration.

OUTREACH

Future Farmers of America – Plant Propagation Workshop

The Future Farmers of America group from Sumner High School (near Kentwood, LA) volunteered their time at the Golden Meadow Plant Materials Center by propagating Caminada Germplasm sea oats. The group consisted of 11 hardworking members that were eager to learn and get the job done. They successfully transplanted over 800 sea oats and this material will be available to eligible growers for future plant distributions. Due to the increasing number of commercial growers, volunteers play a vital role at the Center by helping to propagate the numbers of plants needed for upcoming plant distributions.

The USDA/NRCS Louisiana - Golden Meadow Plant Materials Center (PMC) is responsible in providing foundation plant material to licensed commercial growers who further increase these plants for use in large scale restoration projects. Plants released by the center have proven effective in reducing soil erosion, and promote re-establishment of native vegetation and enhance wildlife habitat. The PMC has released 9 conservation plants for wetland ecosystem and coastal prairie restoration across the northern Gulf Coast.



Photo of Sumner High School FFA Group

United Houma Nation – Plant Propagation Workshop

United Houma Nation Youth Council members and youth of the United Houma Nation traveled to the PMC to assist in the propagation of Lafourche Germplasm California bulrush (*Schoenoplectus californicus*). The Center appreciates the help it receives from numerous volunteer groups that assist with plant propagation. These plants will be available for eligible nursery growers in the summer of 2014. On average, the PMC distributes approximately 30,000 plant propagules to licensed commercial growers each year to ensure that adequate seed and plants are available for use in conservation and restoration programs.



Photo of United Houma Nation Youth Council Members with PMC Manager

The United Houma Nation (UHN) is a state recognized tribe of approximately 17,000 tribal citizens residing within a six parish (county) service area encompassing 4,570 square miles. The six parishes of Terrebonne, Lafourche, Jefferson, St. Mary, St. Bernard and Plaquemines parishes are located along the southeastern coast of Louisiana.

Youth Education

On April 17 and 18, 2013, Alexis Luke and Curt Riche' visited local Lafourche Parish schools to talk to the students about the Natural Resources Conservation Service and the Plant Materials Program, as well as the importance of Arbor Day and Earth Day.



Left to Right: Alexis Luke, Cadence Luke, Lexie Matherne, and Curt Riche'



Photo of Curt Riche' discussing conservation plants for Arbor Day

2013 Ocean Commotion Exhibit



Left to Right: Brandon Waltman, Sam Willis, Alexis Luke, and Curt Riche'

Each year the Louisiana Sea Grant College Program hosts Ocean Commotion at the Louisiana State University (LSU) Pete Maravich Assembly Center. This program attracts approximately 3,000 area students, teachers and chaperones to LSU to learn about Louisiana's coast and sea from about 65 exhibitors. The Program's primary purpose is to give younger students the chance to learn about and actually feel the products of the sea and coast. These products range from plants, aquatic animals and minerals, upon which Louisiana's citizens, are so dependent upon. The Golden Meadow Plant Materials Center participated in this year's event by displaying coastal plant releases and distributing educational brochures to better educate teachers and students about the plants that protect Louisiana's beaches, marshes, bayous and other waterways.

PUBLICATIONS 2013

- 2012 Annual Technical Report
- Marsh Notes Spring Issue 2013
- Marsh Notes Summer Issue 2013
- 2012 Progress Report of Activities
- Louisiana Plant Materials Technical Note 1 – Louisiana Seeding Rate Tables Revised
- Louisiana Plant Materials Technical Note 21 – Lablab for Conservation Use in Louisiana
- LAPMC Tech Note 15 Coastal Wetland Plant Vendors Revised

TOURS, PRESENTATIONS and TRAININGS 2013

- Net Meeting Training – Steps in Developing a Planting Mix
- University of Texas Pan-American Tour and Training
- University of North Texas Tour and Training
- Purdue University Tour and Training
- Louisiana Native Plant Initiative In Support of National Wild Turkey Federation (NWTF) Presentation
- Leadership of Lafourche Tour and Presentation
- PMC and Pollinators Presentation
- Larose Upper Elementary Presentation
- Galliano Elementary Presentation
- Monthly DC led priority topics – PLANTS Training
- Bayou Group Tour and Presentation
- Louisiana Native Plant Initiative in Support of Native American Tribal Groups in Louisiana Presentation
- 3rd Annual Farmer and Rancher Banquet Exhibit
- Net Meeting Training – Planning for People and Pollinator Gardens at your Field Office
- Conservation for New Employees Training
- Net Meeting Training – Planning for Post Establishment Management of Natives

PLANT DISTRIBUTION 2013

‘Vermilion’ Smooth cordgrass	4,000 plants
‘Gulf Coast’ Marshhay cordgrass	1,040 plants
Brazoria Seashore paspalum	275 plants
Timbalier Gulf Bluestem	250 plants
Fourchon Bitter Panicum	400 plants
Various native plants	2,419 plants
Bayou Lafourche California bulrush	105 containers
Caminada Seoats	40 containers
Pelican black mangrove	80 lbs seed

THE GOLDEN MEADOW PMC: WHO WE ARE

The 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.

...AND WHAT WE DO

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

- Plant Materials for Marsh Re-vegetation
- Plant Establishment Techniques
- Seed Technology for Selected Wetland Species
- Technology Development and Transfer

Electronic Documentation and Information

All PMC publications can be downloaded from the following web-sites:

<http://www.nrcs.usda.gov/wps/portal/nrcs/publications/plantmaterials/pmc/southeast/lapmc/pub/>
<http://www.nrcs.usda.gov/wps/portal/nrcs/pmreleases/plantmaterials/pmc/southeast/lapmc/cp/>
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/southeast/lapmc/>

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