



2014 Progress Report of Activities

Golden Meadow Plant Materials Center

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<http://plant-materials.nrcs.usda.gov/lapmc>

This report highlights the major activities at the Golden Meadow Plant Materials Center during calendar year 2014. For more detailed information, contact the Golden Meadow PMC Manager at 985.475.5280.

STUDIES

Evaluation of Inland Saltgrass (*Distichlis spicata*)

Inland saltgrass is a mat-forming, strongly rhizomatous perennial grass. It is endemic to moist, saline soils and thrives in sandy, alkaline areas. It has particularly been useful in saline wetland restoration. Its significance in the marsh is to provide soil and sediment stabilization to deteriorating marshland and provide food and shelter to numerous forms of wildlife and fisheries.

Inland saltgrass is a highly beneficial and desirable grass for coastal and saline wetland restoration projects. However, its lack of quality testing, especially in sufficient numbers, has made it somewhat unavailable to nurserymen for commercial production efforts.

Inland saltgrass produces abundant seed throughout the growing season. In nature, wind and water disperse the seed for natural reproduction of the species, however the plant possesses extensive rhizomes and propagates more easily vegetatively.

Approximately 40 collections of Inland saltgrass are being increased and maintained in greenhouses at the Golden Meadow Plant Materials Center. Collection locations vary and are representative across all areas of coastal Louisiana. The plants will be grown in containers this winter and transplanted to a designated field using a Randomized Complete Block Experimental Design consisting of 3 replications for evaluation. Overall evaluation criteria to be taken will include, but not limited to, vigor, disease vulnerability, biomass, viable seed, plant height and spread.



Figure 1: Photo of *Distichlis spicata* Inland saltgrass maintained in greenhouse

Evaluation of Sand Live Oaks for Re-Establishment along Louisiana's 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 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 provide many species of wildlife with a food source.

In summer of 2013 the Golden Meadow PMC staff in conjunction with Bayou Land Resource Conservation and Development (RC&D), and 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 2013 to determine a survival rate of 90%. Trees appeared to be very healthy while approximately 30% also showed vigorous growth.

Observations for 2014 concluded that sand live oaks planted in areas receiving approximately 50 percent sun and 50 percent shade have expressed the highest percent survivability (70 percent). Trees in these areas are approximately 3 feet in height. Sites where trees were planted receiving nearly 100 percent sunlight expressed less percent survivability and showed signs of chlorosis. These trees also possessed shorter heights.

Specific evaluation sites will be designated in the park for further observation. Data such as vigor, height and diameter will be taken in the designated areas annually.



Figure 2: Photo taken by Gary Fine of Sand Live Oak with Blue-X tree shelter

West Little Lake 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 methods to repair delicate wetlands. The following restoration activities 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 including the West Little Lake, LA Vegetative Planting Project. West Little Lake is located in extremely south eastern Louisiana, an area vulnerable to excessive wind and wave energy, particularly in events of tropical weather systems. Approximately 10,000 Bayou Lafourche Germplasm California bulrush and 900 'Vermilion' smooth cordgrass plants were planted on both the shoreline and interior areas of the lake. The two species were chosen because they are indigenous to the area.

Each vegetative planting project is different and distinctly unique. Since the majority of contracts require vegetative 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, spacing and planting techniques, PMC staff can address potential problematic issues rather quickly and help recommend planting specifications for future projects. As questions arise and if problems are encountered, PMC staff can become aware of them and try to further develop innovative and technical methods and approaches to resolve unforeseen issues.



Figure 3: Photo of *Schoenoplectus californicus* California bulrush being transported to planting site



Figure 4: Photo of Curt Riche' verifying plant spacing and planting depth

2014 ACTIVITIES

Black Mangrove Tour

Dr. LU Chang-Yi, Professor, State Key Laboratory of Marine Environmental Science, Xiamen University, China visited south Louisiana and requested a tour of the south eastern Louisiana coastal marsh, particularly to see black mangrove (*Avicennia germinans* (L.) L.). Dr. LU is involved in an initiative called the U.S. China EcoPartnership on Wetlands. Golden Meadow PMC staff provided transportation to designated areas where black mangrove dominate marsh areas in and around Fourchon, LA. Dr. LU was able to experience the importance of Louisiana's diverse coastal plant communities and how each species plays a vital role in the protection of the coast.



Figure 5: Photo of Dr. LU Chang Yi, Professor and Hsing Chuang, Translator touring Louisiana's marshes

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 graduate students (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

Youth Education

In celebration of Arbor Day and Earth Day the PMC staff visit local Lafourche Parish schools to talk to the students about the Natural Resources Conservation Service, the Plant Materials Program, and the importance plants partake in conservation efforts. Students get hands on experience not only about coastal plants, but why and what it takes for different plant species to survive in the unique areas of Louisiana's coast.



Figure 6: Left to Right: Alexis Luke, Curt Riche', Katie Rousse, Cadence Luke and Lexie Matherne



Figure 7: Photo of Larose Upper Elementary 4th Grade Science Class

PUBLICATIONS 2014

- 2013 Annual Technical Report
- 2013 Progress Report of Activities
- Marsh Notes Spring Issue 2014
- Marsh Notes Summer Issue 2014
- Marsh Notes Winter Issue 2014
- Development of *Spartina spartinae* Lines for Improved Seed Production and Viability for Restoration Along the Gulf Coast Poster
- Vegetative Releases for Beach, Marsh, and Estuary Restoration in South Louisiana Poster

TOURS, PRESENTATIONS and TRAININGS 2014

- Australia Rotary Vocational Training Team Tour
- Bayou Group Tour
- Dinah Maygarden UNO Plant ID Training
- Dinah Maygarden UNO Tour
- Sumnor High School FFA Training
- Sumnor High School FFA Tour
- State of the Coast Conference Presentation
- State of the Coast Conference Exhibit
- Monthly Priority Topic Training – Where Do I Find Information on Native Grasses?
- University of Louisville Tour

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 GMPMC publications can be downloaded from the following web-sites:

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

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