



# 2015 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 2015. For more detailed information, contact the Golden Meadow PMC Manager at 985.475.5280.

## STUDIES

### Winter Cover Crop for Sugarcane Fields – Sunn Hemp

Sunn Hemp (*Crotalaria juncea*) has been touted as a great green manure and cover crop since the 1930's, when it was reported to be an excellent soil improving crop. Sunn hemp produces high organic matter yields while fixing substantial amounts of nitrogen. However, the difficulty in acquiring seed and the inexpensive synthetic fertilizer prices at the time has caused many agricultural producers to abandon the use of this crop. Energy costs have brought leguminous cover crops back to the forefront for sustainable agricultural production and have led to efforts to increase production of sunn hemp seed.



Photo of Sunn Hemp Winter Cover Crop Field

Sunn hemp is a shrubby, herbaceous, sub-tropical annual legume 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.



Photo of AU Golden Sunn Hemp

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

An observational adaptation sunn hemp trial was conducted at the Golden Meadow Plant Materials Center in the spring of 2015. Four varieties were planted in a randomized complete block design consisting of 4 replications. The 4 varieties consisted of AU Golden, Tropic Sunn (Hawaii), Tropic Sunn (Hancock Seed Company) and Red Mini Hemp. All are (*Crotalaria juncea*), with the exception of Red Mini hemp which is (*Crotalaria ochroleuco*). Data collected has revealed numerical differences in plant height, germination, flowering date, biomass, date at 50% flowering, seed production and seed viability among species. This study will be repeated in 2016 for comparison purposes to 2015. A final study report will be finalized once nitrogen content data has been analyzed.

## Initial Evaluation of (*Distichlis spicata*) for Coastal Restoration

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.



Photo of Curt Riche' planting *Distichlis spicata*



Photo of *Distichlis spicata* Inland saltgrass

This species is a highly desired plant for coastal and saline wetland restoration projects; it is frequently included on contract project plant lists put out for bid by many conservation partners, including those representing federal, state and parish governments, and private consultants. When the superior collection of this species has been identified and released for commercial production, it will add to the diversity of other species of plants crucial for sustaining Louisiana's coasts.

Twenty-five collections of Inland saltgrass have been planted in a 1 acre field at the Center. The experimental design used was a randomized complete block consisting of 3 replications for evaluation. Collection locations vary and are representative across all areas of coastal Louisiana. Overall evaluation criteria to be taken will include, but not limited to, plant vigor, disease vulnerability, biomass, seed viability, plant height and spread.

## FIELD TRIALS

### Cocodrie Field Trial, Terrebonne Parish, LA

Cocodrie is located in extreme south east Louisiana making the area extremely vulnerable for soil erosion and land loss. Over the last several decades, tropical storm events have pounded the area and substantial amounts of land have vanished due the intense wave action and storm surges the area has received. What used to be marshland has and is still turning to open water. Natural Resource Conservation (NRCS) specialists and Coastal Protection and Restoration Authority (CPRA) employees conducted a vegetative field trial in marshes south of Cocodrie in areas deemed susceptible to being lost. Several hundred smooth cordgrass (*Spartina alterniflora*) plugs were hand planted in predetermined sites in grids adjacent to naturally occurring smooth cordgrass sites. The overall objective is to see how

long of a period of time would it take to close in the gaps of these areas of broken marsh. Smooth cordgrass was planted in several different sites and in slightly different arrangements (number of rows, row length, plant spacing) at each site. In addition, Black mangrove (*Avicennia germinans*) were planted in areas where smooth cordgrass naturally occurred. In coastal Louisiana the two species can be found naturally occurring in conjunction to one another due to their tolerances to high salinities.

Approximately 4 months later a follow up visit was made to determine health and survival percentages of the installed plants. Overall for all sites of smooth cordgrass, it was determined that about 40% of the plants installed survived with the exception of one area that was less than 5% survival probably due to water depth. Overall, Black mangrove survival was at about 80% probably because they were planted in higher elevated areas where smooth cordgrass naturally persisted and water depth was not a threat to survival.



Photo of Black mangrove for Cocodrie Field Trial

## ACTIVITIES

### 2015 NRCS Marsh Planning Workshop

A marsh workshop was conducted at the Golden Meadow PMC for new NRCS employees unfamiliar to south Louisiana's unique wetlands. Over 30 attendees took part in the workshop and veteran conservation planners taught the 9 steps of conservation planning, water, salinity, energy and hydrology of the wetlands. Soil scientists, engineers and biologists including Kevin Norton, Louisiana's state conservationist, were in attendance and delivered their levels of expertise to the attendees.

A field tour was then held and the group was shown the differences in fresh and saline marsh environments. Biologists brought to the group's attention the differences in vegetation and wildlife in the two environments. Soil scientists made soil borings and the group was able to visually see, feel and smell the differences in soil properties.



Photo of Kevin Norton, Louisiana State Conservationist and NRCS employees attending the Marsh Planning Workshop

## Pointe-Aux-Chenes Vegetative Planting



Photo of California bulrush for Pointe-Aux-Chenes Planting

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 restore 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 Pointe-Aux-Chenes, LA Vegetative Planting Project. Pointe-Aux-Chenes is located in south eastern Louisiana, an area venerable to excessive wind and wave energy, particularly in events of tropical weather systems. Approximately 4,000 Bayou Lafourche Germplasm California bulrush plants were planted in interior areas of the lake. This species was chosen because it is 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 technical methods and innovative approaches to resolve unforeseen issues.

## 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 future plant development for 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 are allowed to become familiar with the coastal plants while being educated on why each species has its unique placement in the dynamic coastal puzzle.



Photo of Galliano Elementary students for Earth Day and Arbor Day Celebration

## NEW EMPLOYEE



Photo of Dan Pingel, Biological Science Technician, GMPMC

Daniel Pingel is our new Biological Science Technician at the NRCS Golden Meadow PMC in Galliano, LA. He is a native of Cartersville, GA and has earned a Bachelor of Science in Biological Science from Georgia State University in Atlanta, GA. Daniel, who goes by Dan, is in the process of finishing his Master of Science in Integrative Biology with a focus on Coastal Restoration from Kennesaw State University in Kennesaw, GA. He is an Eagle Scout and enjoys the outdoors, computers and helping the environment. We would like to welcome Dan to south Louisiana to join our Plant Material's family.

## PUBLICATIONS 2015

- 2014 Progress Report of Activities
- LAPMC Tech Note 15 Coastal Wetland Plant Vendors
- Release Brochure Fourchon Germplasm bitter panicum
- Release Brochure Brazoria Germplasm seashore paspalum
- Release Brochure Timbalier Germplasm gulf bluestem
- Marsh Notes Fall Issue 14

## **TOURS, PRESENTATIONS and TRAININGS 2015**

- Marsh Planning Workshop
- Why is Soil Health Important? CEU Training

## **RAINFALL DATA 2015**

The Center received 57.69 inches of rainfall for 2015. The average amount of rainfall recorded from 1992 to 2014 is 63.72. Fortunately we did not encounter any significant tropical events which would have increased rainfall amounts drastically above 57.69 inches.

## **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/>

## **Golden Meadow Plant Materials Center Staff**

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