

# 2008 Progress Report of Activities

July 2009

## USDA-NRCS Brooksville Plant Materials Center

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### Mission and Objectives

The Brooksville Plant Materials Center (PMC) is operated by the USDA, Natural Resources Conservation Service (NRCS). The mission of the Plant Materials Program is to deliver effective state-of-the-art plant science technology to meet the nation's natural resource conservation needs. To this end, we identify superior accessions (collections) of adapted plants which are then tested and released to be produced by commercial growers. We also provide technical assistance

in plant production and management techniques. Evaluation and use of native plant materials is emphasized.

The major conservation objectives we address at the Brooksville PMC are:

- Improve and maintain water quality
- Control erosion on cropland and stabilize critical areas
- Improve forage on pastures and rangeland
- Improve wildlife habitat

### Conservation Concerns:

- Improve and Maintain Water Quality
- Control Erosion on Cropland and Stabilize Critical Areas
- Improve Forage on Pastures and Rangeland
- Improve Wildlife Habitat

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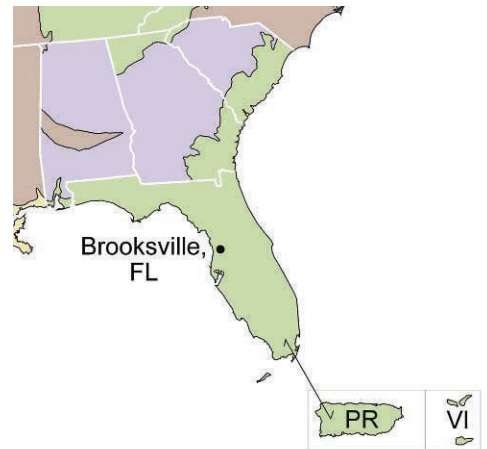
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Helping People Help the Land

### About the Brooksville Plant Materials Center

The PMC is located 7 miles north of Brooksville, FL on US Highway 41, 15 miles inland from the Gulf of Mexico. Our service area includes all of Florida, Puerto Rico, and the US Virgin Islands; and the coastal areas of Georgia, South Carolina, and Alabama, indicated in green on the map (right).



There are 43 acres under cultivation, which are used for the evaluation and production of plant materials. The remaining 139 acres of the property are native woodlands and planted pines. Structures include office and conference buildings, two greenhouses, a seed processing building, a laboratory, a shop with equipment storage barns, and an open educational shelter. Wildlife, such as deer and wild turkey, is abundant in the wooded areas and can be seen along trails or around the edge of the fields.



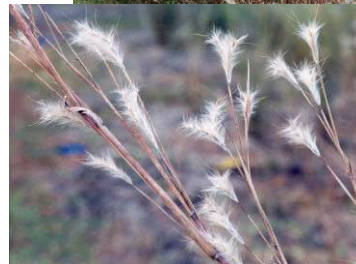
## Plant Release Completed in 2008

### Fort Cooper Germplasm Splitbeard Bluestem

The PMC completed the release of a splitbeard bluestem (*Andropogon ternarius*) germplasm in 2008. It was released as source-identified material, meaning it came from a known geographic location, but this accession (number 9060084) was not subjected to extensive testing for adaptation and performance. However, seed production experience at the PMC has shown that it produces fairly good quantities of moderately to highly viable seed. It was collected in Fort Cooper State Park, which is located in Citrus County, FL and was named Fort Cooper Germplasm after its source location.

Splitbeard bluestem produces fluffy, white flowers (right) and can be distinguished from other bluestems by the tuft of silver hairs that remain at the base of the inflorescence after the seeds disperse. Splitbeard bluestem is a common component of many Florida rangelands and can be used for rangeland restoration (NRCS Conservation Practice 550). It provides excellent habitat for wildlife (645, 386) and its root system can help

control soil erosion (342). It is very well adapted for use on poor sandy soils. The seedheads are quite attractive, so it also has potential value as an ornamental.



## Pending Plant Releases

### A Sweetgrass and an Ornamental Lopsided Indiangrass



Sweetgrass (left), a.k.a. gulf hairawn muhly (*Muhlenbergia sericea*) is a grass found along the coast from North Carolina to Texas. Sweetgrass leaves are the base material

used by descendants of African slaves, or Gullah, who live near Mount Pleasant, SC in their coiled basketry. A majority of the local populations of sweetgrass have been destroyed by coastal development, depriving the Gullah basketmakers of their livelihood. Restoring populations of sweetgrass is a recognized cultural need in South Carolina. The sweetgrass release (accession number 9060701) to be completed in 2009 is the result of a cooperative effort undertaken by the Brooksville PMC, Clemson University, and the U.S. Army Corps of Engineers, Charleston District. It was collected on the beach fronts of Kiawah Island, SC and Little St. Simons Island, GA.

Lopsided Indiangrass (*Sorghastrum secundum*) is a native grass that is an important forage component of many Florida rangelands. For this reason, the PMC began making collections of this grass in 1990 with the goal of selecting improved Florida genotypes for range planting (550) and wildlife habitat improvement (645, 386). However, during evaluation of these collections, three accessions, 9060186, 9060197, and 9060205, from Marion, Levy, and Gilchrist Counties (FL), respectively, all had similar flowering times and the color of the foliage was bluer than is typical for the species. The three accessions were planted in a block and allowed to cross-pollinate to form accession 9060564. This accession was targeted for release as an ornamental for the nursery trade because of its blue foliage and the striking one-sided inflorescences (right) produced by this grass.



### Cogongrass Plant Competition Study

Cogongrass (*Imperata cylindrica*), a native of Southeast Asia, is ranked as one of the worst invasive weeds in the world. It is a major problem along roads, and in pastures and natural areas in Florida. Dr. Oghenekome Onokpise (Dr. Kome) of Florida A&M University (FAMU) in Tallahassee observed a patch of hairawn muhly (*Muhlenbergia capillaris*) that was surrounded by, but not being invaded by, cogongrass while driving through St. Marks National Wildlife Refuge in northern Florida. His preliminary greenhouse research showed that muhly had competitive and possibly chemical properties that affected growth of cogongrass. He wanted to see if other native grasses could also compete with cogongrass and contacted the PMC about obtaining plants of two of our releases, Citrus Germplasm maidencane (*Panicum hemitomon*) and Miami Germplasm switchgrass (*Panicum virgatum*) for testing.

In August of 2007, we began cooperative field studies to determine if the competitive ability shown by these three species in the greenhouse is also exhibited in the field. Small transplants of each species were planted in monocultures and mixed in all possible combinations in four preplant treatment strips. Planting strips were ei-

ther mowed (control), rotovated, or sprayed with imazapyr or glyphosate two weeks before planting. Two planting locations were used, one in Brooksville at the USDA-ARS Subtropical Agricultural Research Station and the other in Tallahassee. Each site had a dense existing stand of cogongrass when treated. Survival of the transplants and stands of cogongrass in the plots are being rated quarterly by PMC personnel and Dr. Susan Bambo (below) of FAMU. We anticipate that this research might potentially result in a novel technique that can be used to manage this terrible weed.



### Eastern Gamagrass Demonstration Plantings

Eastern gamagrass (*Tripsacum dactyloides*) is a large, bunch grass native to the eastern US. Livestock find it to be highly palatable and it has great promise for addressing numerous conservation concerns. The PMC has selected an eastern gamagrass accession (9029266), that was collected in Polk County, FL, for seed increase and release. It can be used for erosion control (386, 601) and pasture and range plantings (512, 550). This accession performs well in Florida, but is thought to be poorly adapted to areas with colder winters.

Demonstration plantings to evaluate establishment of eastern gamagrass seed were installed in the summer of 2008. Two widely planted cultivars from the Great Plains, 'Pete' and 'Iuka', and a newer release from Tennessee named 'Highlander' were included in the plantings to compare their establishment and growth with 9059266. The plan was to plant in all four NRCS administrative regions in Florida, but sites could not be located in the northeast (Area 2) or in the south (Area 4). In the Panhandle (Area 1), plots were planted at the University of Florida, North Florida Research and Education Center in Marianna. The plots in Area 3 were

located on a ranch in Osceola County. Chuck O'Rourke, NRCS District Conservationist at the Kissimmee Service Center is pictured below planting these plots. An additional site was planted in southern Alabama, since 9059266 could potentially be used in that state as well. Seed germinated well at the two Florida sites. The landowner at the Alabama site did not exclude his livestock and the seedlings did not survive. Growth of these plants will be observed in 2009.



### Slender Woodoats Testing

Florida's sub-tropical climate is too warm and dry during the winter months to favor growth of many cool-season grasses. This means that livestock producers often have little green forage available for their animals during the winter months. Greg Hendricks, Florida State Resource Conservationist, recognized this need and directed the PMC to begin collections of slender woodoats (*Chasmanthium laxum*), a Florida native cool-season grass for possible use in pastures (512). This grass produces a fairly high percentage of viable seed, which increase its potential for commercial use. Plant collections began in 2004 and were completed in 2006.

Initial evaluation blocks were planted at the PMC in 2008 (right). Slender woodoats is a clump-forming grass that produces slender spikes of flowers beginning in May or June. Growth and vigor of the slender woodoats accessions are being compared to Kinchafoonee Germplasm Virginia wildrye (*Elymus virginicus*) (left, front) released by the Georgia PMC, which is also a cool-season native grass well adapted to Florida.

The PMC initiated a clipping trial in 2007 to determine if slender woodoats can tolerate defoliation. Clipping regimes being tested include a dormant clip in December and ones in February and April. If results of this test are favorable, further testing will be conducted to refine management recommendations for this species.



### Ornamental Hairawn Muhly Final Evaluations



This was the third and final year of a cooperative study with Drs. Gary Knox and Jeff Norcini, both stationed at the University of Florida, North Florida Research and Education Center (NFREC) in Quincy, to evaluate ornamental hairawn muhly (*Muhlenbergia capillaris*) accessions. Hairawn muhly is a native, ornamental grass that is commonly used in many municipal, roadside, and commercial plantings in Florida. However, nurseries have done little selection for improved types. As a consequence, these plantings often have a non-uniform appearance due to differences in growth habit, flower production, and other characteristics.

During previous testing, PMC personnel had selected eleven hairawn muhly accessions that had superior ornamental characteristics. These accessions included ten with purple to pink flowers and one white-flowered one, which was released as Morning Mist Germplasm in 2006. In this test, these eleven accessions are being compared to a commercial purple (an unnamed one from Monrovia Nursery) and another white-flowered muhly (White Cloud from Superior Trees). Plots were planted at the PMC and the NFREC in April 2006.

Plots were rated monthly for visual quality throughout the growing season by PMC and NFREC personnel; flowering dates were recorded weekly in the fall and plant measurements were taken annually. The accession that performed best at both locations was 9059929 from Jefferson County, FL. Plants of this material will be increased at the PMC for release. Results of this study will also be published in a scientific journal.

In October 2008, the PMC hosted a meeting of the Coastal Springs Chapter of the Florida Nursery and Landscape Association. Since these individuals are actively involved in the nursery trade, we asked them to provide their opinions of the accessions (above, left).

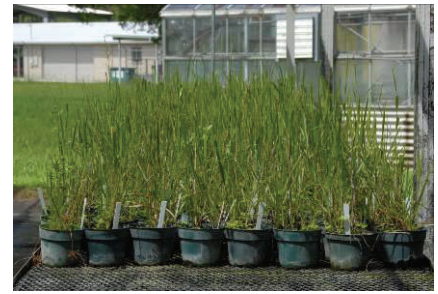
## Switchgrass Germplasm Development



Switchgrass (*Panicum virgatum*) is a warm-season native grass that has recently made a name for itself as a bio-energy crop. Most commercial cultivars of switchgrass currently on the

market came from other parts of the country and are poorly adapted for use in Florida. Miami, Stuart, and Wabasso, three germplasm releases made by this PMC in 1996, are all poor seed producers under Florida conditions and were released as vegetative material. There is little economic justification for vegetatively planting switchgrass in pastures (512), rangelands (550), and critical areas (342), and as a consequence, use of these releases has been limited. The need to develop a seed-propagated switchgrass for use in Florida led us to make additional collections within the state. We collected seed from 101 accessions and began initial evaluations at the PMC in 2001.

Plants in this assembly exhibited a great deal of phenotypic variability in growth form and appearance, with plants ranging from highly clump-like to rhizomatous and varying in height, foliage color, and amount of pubescence (hairiness). Much of this variability is thought to be due to the fact that switchgrass is naturally polyploid (more than two sets of chromosomes). In order to develop a high quality seeded switchgrass germplasm for release, we need to know the ploidy levels of all the accessions in the assembly. We do not have equipment to perform this testing at the PMC, so we are cooperating with Dr. Kenneth Quesenberry at the University of Florida and Dr. Brian Baldwin at Mississippi State University to determine the chromosome numbers. All surviving accessions are currently being dug and divided (right) so that plants with similar numbers of chromosomes can be planted together in crossing blocks.



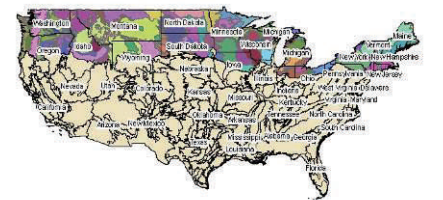
## Revision of VegSpec Plant Recommendations

In the spring of 2008, the Brooksville PMC and the Florida Plant Materials Specialist were contacted by Robert Escherman, who was then the USDA, NRCS National Program Leader for Plant Materials, about our interest in working on a revision of VegSpec. VegSpec is a web-based system designed to assist in making appropriate vegetative choices for revegetation planning and design. It is housed on the PLANTS Database (<http://plants.usda.gov>), which is overseen by the NRCS National Plant Data Center in Baton Rouge, LA. There are currently over 2000 commonly used plants contained in the VegSpec data set. The sites and applications in which these plants would be recommended for use by the VegSpec program were based on the opinions of numerous local experts.

The purpose of the VegSpec redesign was to attempt to link plant recommendations to Major Land Resource Areas (MLRA). A MLRA is a geographic portion of the country with similar soils, climate, elevation, topography and land use patterns. The initial step in redesigning the program was to use ARC/GIS technology to relate herbarium records of counties in which a species

was collected, with the MLRA in which these collections occurred. This was done by GIS specialists at the NRCS Central National Technology Support Center in Ft. Worth, TX. This created a map of where the plant had been collected. However, plants are often collected in areas that are outside their area of actual usability. Therefore, the distribution maps needed to be modified by individuals with knowledge of the plants themselves.

The Florida contingent undertook the revision of plants for the eastern portion of the country and plant materials specialists in Oregon and Idaho worked on those species used in the West. The distribution map (right) is an example of one we generated for one of the species we were assigned.

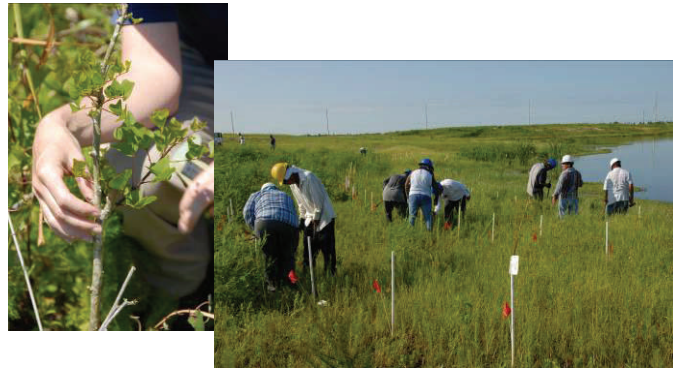


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## Planting Woody Whips on Phosphate Minelands

Phosphate mining companies in Florida are required to restore vegetation on sites adjacent to ponds, creeks, and streams on lands they have mined (544). In order to restore woody species to these areas, they are currently investing a great deal of money in planting containerized or bare-root plants. However, the spectrum of species marketed by the nursery industry is often limited and the regulatory authorities desire a larger diversity of species to improve habitat for wildlife (644, 391, 395).

Bioengineering using whips or live stakes is a restoration technique that consists of planting large diameter stems of easily rooted woody species to stabilize banks along streams and ditches with low to moderate flow velocities (580). This practice is widely used in the western U.S., but rarely used in the Southeast. The PMC was asked by two members of our Technical Advisory Committee, Rosemarie Garcia, a restoration specialist at Mosaic, LLC, and Casey Beavers, from the Florida Department of Environmental Protection, Division of Mining and Mineral Reclamation, to test the potential of planting woody whips on recontoured slopes along ponds on land Mosaic is reclaiming. Plantings began in 2008 and will be repeated in 2009.



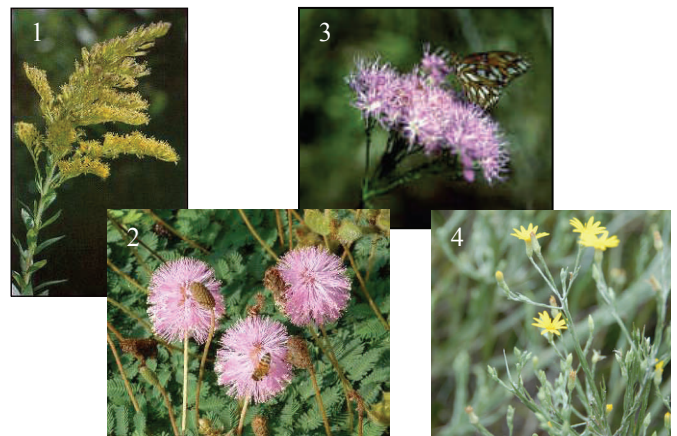
In the West, woody whips are planted in the winter when the plants are dormant and the water levels are at their highest. However, in Florida, winter is the dry season and woody plants may never go completely dormant. We planted in January and July (wet season). Rows of whips were planted at three elevations extending up from the waterline (above, right). Seventeen species were planted on both dates. Species that rooted best were Carolina willow (*Salix caroliniana*) and elderberry (*Sambucus nigra* ssp. *canadensis*). Swamp dogwood (*Cornus foemina*) and coralbean (*Erythrina herbacea*) (above, left) also look promising. We need further data to determine the best planting date.

## New Plant Collections

During the fall 2008 meeting of the Florida Plant Materials Technical Advisory Committee, it was decided that the PMC would begin collections of four native herbaceous flowering species or forbs. All four species are attractive plants, which can be used in yards, public areas, and along roadsides and are also excellent food sources for bees, butterflies, and other pollinators. Seed collections of these species will begin in 2009.

1. Pinebarren goldenrod (*Solidago fistulosa*) has yellow flowers on a branched flowering stalk. This goldenrod is found throughout Florida, often in somewhat wet sites.
2. Powderpuff or sunshine mimosa (*Mimosa strigillosa*) can be found growing throughout the state. It is a low-growing legume with round clusters of pink flowers.
3. Coastalplain chaffhead (*Carphephorus corymbosus*) has rose-colored flowers held in highly distinctive flat-topped clusters. This plant can be found growing on drier sites in northeastern and peninsular Florida

4. Narrowleaf silkgrass (*Pityopsis graminifolia*) has narrow, grass-like leaves covered with silky, white hairs, and small yellow flowers. It can be found growing throughout Florida, mainly on drier sites.



We will be asking NRCS field office personnel, as well as industry and university cooperators, native plant enthusiasts, and county master gardeners to assist with our seed collection efforts.

## Construction of a New Headhouse



A headhouse is a work building that is in close proximity to or attached to a greenhouse. Headhouses provide space for potting and other plant production activities and areas to store pots,

potting medium, and related supplies. The hardened walls of a headhouse provide a surface for mounting vital electrical and irrigation equipment, that, due to physical or safety considerations, cannot be mounted in the greenhouse itself.

The old PMC headhouse (above) was a 11' x 22' structure with a concrete block foundation and wooden siding, which was attached to our glass greenhouse. There was a 9' x 9' fiberglass-covered walkway that connected this building to the second PMC



greenhouse. In addition to being much too small, both structures were badly deteriorated, and the interior provided a less than desirable working environment (bottom, left). So

we generally chose to pot our plants outside.

Funding was provided in 2008 to replace this headhouse with a larger, more functional steel building (above). The new headhouse (below) is 20' x 30' and has two roll up doors to accommodate moving plants and supplies into the building and out of the building to the shadehouse (not pictured). Translucent panels in the roof provide passive lighting and walk-through doors connect it to the two greenhouses.

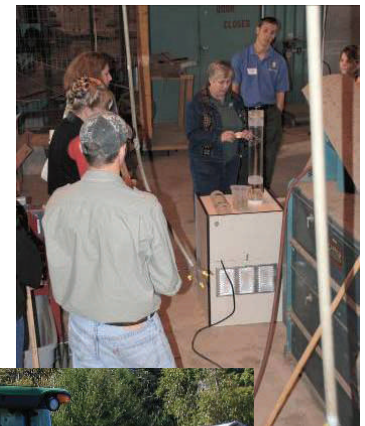


## Rangeland Plant ID and Seed Processing Workshop

The Florida Chapter of the Society of Range Management (SRM) hosted a plant identification and seed technology workshop at the PMC on November 5 and 6. The first day of the training was devoted to formal, classroom style presentations. Greg Hendricks, Florida State Resource Conservationist, provided information on important native plants on Florida rangelands. He was followed by the PMC Manager, Janet Grabowski, with an overview of grass taxonomic terminology. The final presentation of the day on rangeland restoration techniques was given by Mimi Williams, Florida Plant Materials Specialist.

The hands-on training portion was held the following day (right). Three training sessions were held concurrently. In one session, Janet and Mimi provided training on seed cleaning techniques. In another, PMC Biological Science Technicians, Mary Anne Gonter and Ed Black showed participants equipment and techniques used to harvest and plant seed of native species. The third session was held at the nearby Withlacoochee State Forest Headquarters Tract, where Greg provided information on native plant identification.

*Hands-on training being given to attendees of the Rangeland Plant ID and Seed Technology Workshop held last fall at the PMC. This training was hosted by the Florida Chapter of the Society for Range Management*



## Training, Meetings, and Tours

### Training Held at the PMC

- April 3 - Seed Cleaning/Seed Germination Training for Hillsborough County Master Gardeners - Janet, Mimi, Mary Anne and Ed
- November 5-6 - Rangeland Plant ID and Seed Technology Workshop (see Page 7) - Janet, Mimi, Ed, and Mary Anne

### Other Training

- August 25-29 - Field Exercises Coordinator for the NRCS Conservation Planning Advanced Topics Course - Kissimmee, FL - Mimi
- October 2 - Botanic Nomenclature Review for Grass/Sedge Identification Training - Sarasota, FL - Janet

### Presentations Given at Meetings and Symposiums

- January 28 - Poster on Hairawn Muhly for Urban Conservation - 2008 Annual Meeting of the American Forage and Grassland Council/the Society for Range Management (AFGC/SRM)- Louisville, KY - Mimi
- January 28 - Poster on Determining the Optimum Number of GPS Collars for Livestock Distribution Studies - 2008 AFGC/SRM Meeting - Mimi
- June 16 - Overview of the Brooksville PMC - Florida NRCS Area 3 - Brooksville, FL - Janet
- June 16 - Activities of the Plant Materials Specialist - Florida NRCS Area 3 - Brooksville, FL - Mimi
- March 29 - Considerations for Planting in the Dunes - Naturescaping Event - Palm Beach County, FL - Mimi
- September 4 - Using Native Range in Florida Grazing Systems - Florida Grazing School - Labelle, FL - Mimi
- September 8 - Overview of the Brooksville PMC - monthly meeting of the Hernando County Chapter of the Florida Native Plant Society - Brooksville, FL - Janet
- October 8 - Presentation on Ft. Cooper Germplasm Splitbeard Bluestem - 6th Eastern Native Grass Symposium (ENGs) - Columbia, SC - Janet

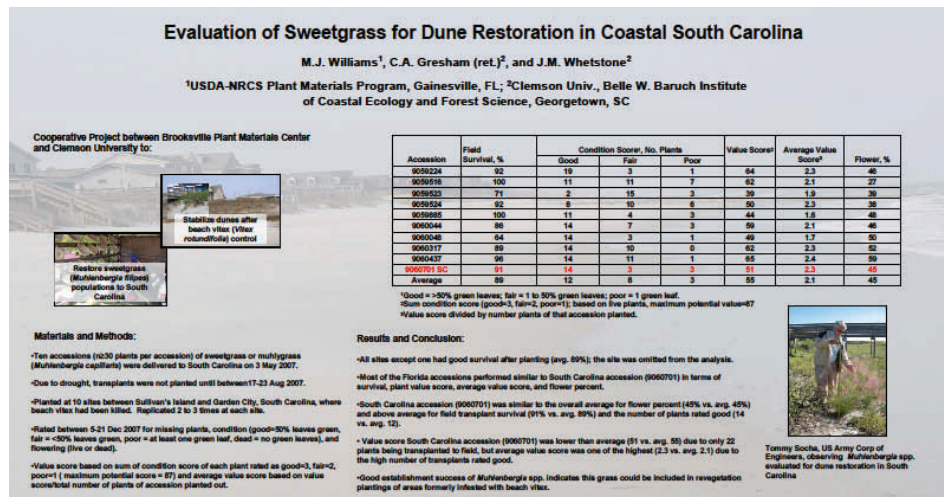
- October 8 - Poster on the Sweetgrass Evaluation Planting in South Carolina - 6th ENGs (below)
- October 8 - Poster on Stratification of 'Highlander' Eastern Gamagrass Seed - 6th ENGs - Joel Douglas presented based on research conducted by Janet

### PMC Display

- January 28 - National Plant Materials Display - 2008 Annual Meeting of AFGC/SRM - Louisville, KY - Mimi
- February 22-23 - Tampa Bay Wholesale Growers - Tampa, FL - Janet and Mary Anne
- September 25-27 - Florida Nursery and Allied Trades Show - Orlando, FL - Mary Anne

### Other PMC Tours

- April 3 - Hillsborough County Master Gardeners - Janet, Mimi, and Mary Anne
- June 16 - Florida NRCS Area 3 Meeting - Janet and Mimi
- October 21 - Coastal Springs Chapter of the Florida Nursery and Landscape Association - Janet, Mimi, and Mary Anne (See Page 4)
- November 20 - University of Florida, Institute of Food and Agricultural Sciences, Pasco County Extension Personnel - Janet, Mimi, and Ed



PMC Information is Available Online at:  
<http://www.fl.nrcs.usda.gov/programs/flplantmaterials.html>  
 or  
<http://plant-materials.nrcs.usda.gov>

Carlos Suarez, *Florida State Conservationist*  
 Greg Hendricks, *Florida State Resource Conservationist*  
 M.J. (Mimi) Williams, *Florida Plant Materials Specialist*

### PMC Staff:

Janet Grabowski, *Manager*  
 Mary Anne Gonter, *Biological Science Technician (Plants)*  
 Edmond (Ed) Black, *Biological Science Technician*  
 Pamela Page-Fiske, *Secretary*  
 Vacant, *Biological Science Aid*

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