



Jamie L. Whitten Plant Materials Center

2000 Progress Report of Activities

March 2001

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This document highlights many of the activities and products that the USDA-NRCS Jamie L. Whitten Plant Materials Center produced during FY 2000.

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Visit Our Web Site at:
Plant-Materials.nrcs.usda.gov



What We Do

The Jamie L. Whitten Plant Materials Center (PMC), located in Coffeerville, Mississippi, is operated by the USDA Natural Resources Conservation Service. Our mission is to develop, test, and transfer effective state-of-the-art plant science technology to meet customer and resource needs. Our program has an excellent internal system for identifying future plant materials needs, coupled with a seamless system of product development and program delivery.

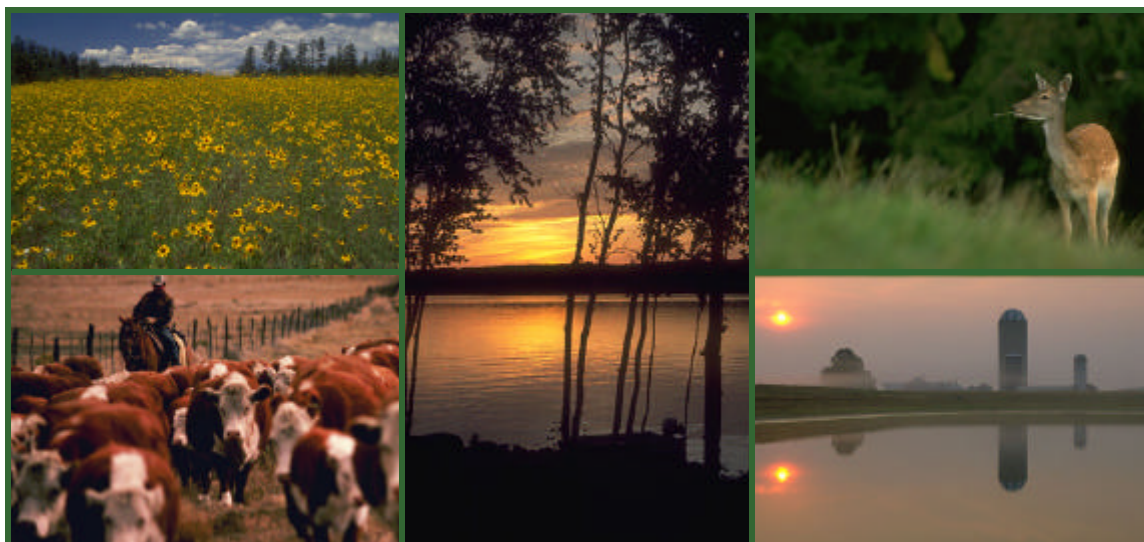
In working with a broad range of plant species, including grasses, forbs, trees, and shrubs, the PMC seeks to address priority needs of field offices and land managers in both public and private sectors.

Conservation Objectives

The PMC works closely with NRCS field offices and land managers on a broad range of conservation concerns and issues. Pastureland Improvement, Cropland Erosion Control, Critical Area Erosion Control, Wildlife Habitat Enhancement, and Water Quality Improvement are the major conservation issues in our service area which includes Mississippi, the delta regions of Arkansas, Louisiana, Tennessee, Missouri, Kentucky and the Blackland prairie of Alabama.

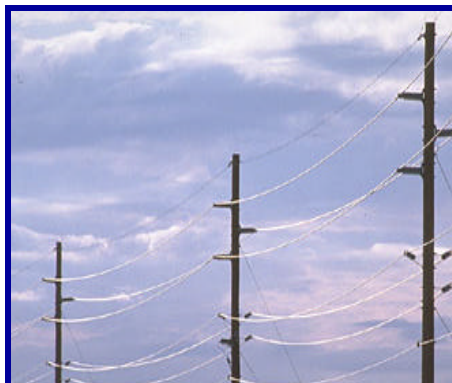
To accomplish our mission objectives we generate numerous products including plant releases, written plant science information and public presentations. This document highlights many of the activities accomplished during fiscal year 2000.

For more detailed information, contact the PMC at (662) 675-2588.



The PMC's main objective is to find vegetative solutions for conservation needs in the following areas: Water quality, pasture, cropland, critical area erosion control and wildlife habitat.

Bioenergy Crops as a Sustainable Energy



The PMC is actively involved in the Bioenergy Feedstock Development Program of the U.S. Department of Energy. We are evaluating warm season perennial grass crops for production of large quantities of low-cost, high-quality biomass feedstock for use as liquid biofuels and biomass electric power.

The PMC is currently developing management practices that optimize yield, persistence and ash content of eastern gamagrass, switchgrass, weeping lovegrass, bermudagrass and caucasian bluestem.

Limited rainfall and cutting management (1 cut vs. 2 cut) influenced yield in 2000. We found that a two cut system (June and September) produced the highest yield for eastern gamagrass (6.6 tons/acre) and bermudagrass (5.3 tons/acre). A one cut system produced the greatest yield for switchgrass (9.2 tons/acre) when harvested in September.



Initial Evaluation of Switchgrass

Grass Entry	1 Cut	2 Cut
	tons/acre	
Switchgrass	9.2	8.5
Eastern Gamagrass	4.1	6.6
Bermudagrass	5.3	5.2

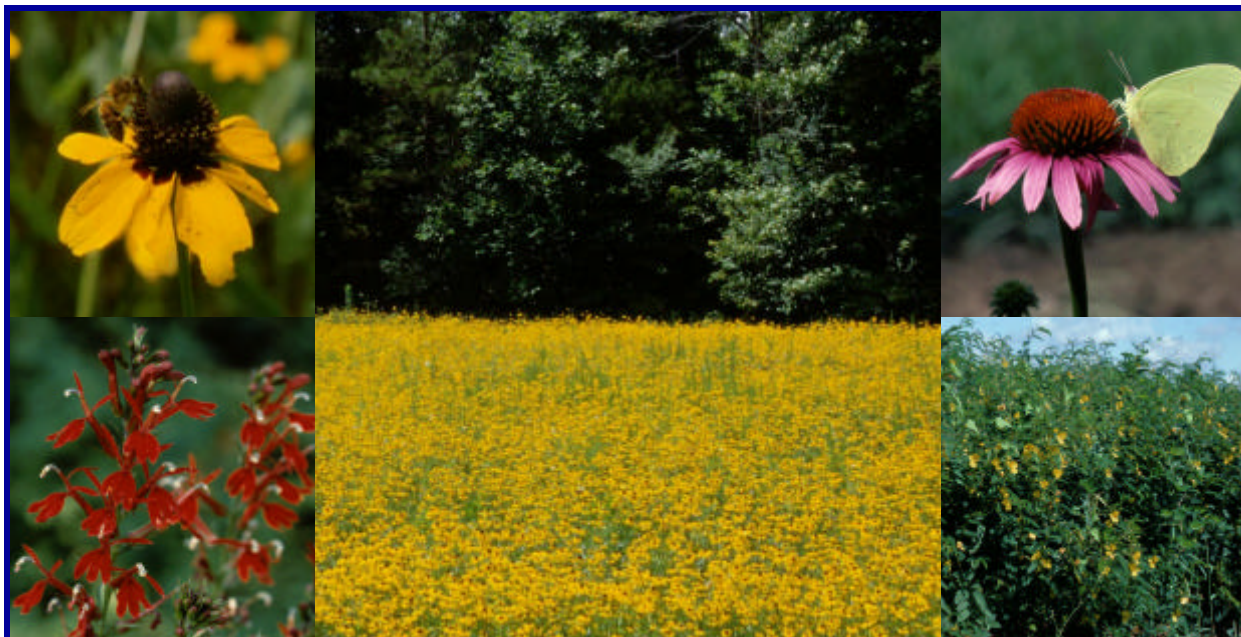


Eastern gamagrass can be planted and harvested with conventional farming equipment

Newly established experimental plots of caucasian bluestem yielded 1.5 tons/acre in September from a June planting. We are also working cooperatively with Oklahoma State University in evaluating superior lines of switchgrass for suitability as a bioenergy crop in Mississippi. We will continue these studies in 2001.

Energy crops such as the ones mentioned above may be grown and produced on marginal cropland. In addition to protecting the natural resources on these lands, biomass energy crops improve the rural economy by encouraging domestic economic growth.

Native Wildflower Conservation Program



Mississippi has a rich and varied assortment of wildflowers that provide beautiful splashes of color from spring to fall in all areas of our state. The Native Wildflower Conservation Program functions as a means for the eighty-two Soil and Water Conservation Districts within the state to distribute native Mississippi wildflower seeds to local residents. This program is a joint venture between the PMC and the Mississippi Soil and Water Conservation Commission.

Available wildflowers were originally collected within the state and have been cultivated and harvested at the PMC. These wildflowers are used in home gardens, parks, and schoolyards, as well as along roadsides and other areas where a more natural appearance is desired.

In addition to seed production for the Wildflower Conservation Program, we have also conducted research on the effect of herbicides and of various management techniques on stands of native wildflowers and grasses. Previous research has shown that of the common preemergence herbicides applied,

Dacthal was the only one that did not damage the wildflower seedlings. The most promising postemergence herbicide for use on wildflowers was Plateau.

In the management study we tested a spring burning treatment and mowing schemes ranging from regular mowing after mid-May to first mowing in June and July. Each scheme favored certain wildflower and grass species, but stands were declining in 2000 due to a deep thatch layer on the soil surface. The plots were lightly disked in the early fall to encourage reestablishment.

Wildflowers Available for Distribution

Black eyed Susan	Plains Coreopsis
Lyre-leaf Sage	Partridge Pea
Clasping Coneflower	Bur Marigold

Available 2002

Purple Coneflower	Cardinal Flower
Swamp Rose Mallow	

Native Warm Season Grasses

Conservationist across the Mid-South have shown increased interest in using native grasses for wildlife habitat, soil and water conservation, landscaping, biofuels and forage production. Native warm season grasses can withstand extreme winter cold and extended periods of drought because they have evolved in regional conditions.

Switchgrass and eastern gamagrass are useful native grasses but because of tillage and heavy grazing, stands of these grasses have declined. Before native grasses can gain widespread use, establishment and management techniques must be refined to make them more user friendly.

Native grass establishment is often hampered by weed competition. The PMC is investigating ways to overcome establishment problems. Eight different planting techniques for switchgrass were evaluated over a two year period. We found that spraying Roundup at 1 lb/ai in late summer then preparing the seedbed in the fall and then without disturbing the seedbed, no till drill the seed in early spring gave the best results. Another promising treatment was to control weeds with Gramoxone at 1 lb/ai in the early spring, then prepare the seedbed and broadcast plant the first part of May with no additional seedbed disturbance.



Native Grass Mixture



Eastern gamagrass hay production

The PMC is in the final stages of evaluating eastern gamagrass accession 9062680. We plan to release this native grass to producers in 2003. We are currently comparing the yield and persistence of 9062680 to ‘Jackson’ and ‘Pete’ eastern gamagrass at three locations across Mississippi. We will also determine the effect of N rates on forage and seed production at three locations.

We are also working cooperatively with the Agriculture Research Service in Woodward, Oklahoma to evaluate four experimental lines of eastern gamagrass for their suitability in the Mid-South.

The PMC is currently working with Mississippi State University to develop equations to estimate digestibility of 9062680 eastern gamagrass and ‘Alamo’ switchgrass. These equations will help livestock producers and forage specialists estimate feed values of different native grasses and determine the amount of nutrient supplement needed for various animal classes.

Seed Technology

Difficulties in establishing seeds of native species in the field are one of the major factors that prevent widespread use of these plants. Seed dormancy, specialized planting requirements, and fierce competition from weedy species are some of the major problems. Through past research we have developed some successful establishment techniques for native wildflowers and native grasses such as switchgrass.

Currently the main focus of our seed technology research is on eastern gamagrass, which in addition to field establishment problems also has a problem with low seed yields. We are conducting an experiment to look at seed treatments such as gibberellic acid, kinetin, and potassium nitrate to improve germination of seeds that were treated with a cool, moist treatment (stratification). Gibberellic acid appears to increase the speed at which stratified

seeds germinated, but the experiment needs to be repeated because hot, dry weather conditions during testing did not permit a complete evaluation of these treatments.

We are also looking at seeding depths of 0.5 to 3.0 inches to determine if stratified seed can emerge from deeper depths where soil moisture is higher. Seeds planted at 0.5 inch are capable of producing a quicker stand but we recommend planting depths of 1 to 2 inches due to the improved soil water relations at these depths. We are also addressing the eastern gamagrass seed production problem by examining how nitrogen application with rates ranging from 0 to 200 pounds in single and split applications affects seed yields and by using ethephon (Prep) treatments to increase uniformity of seed ripening. Both these studies are in the preliminary stages and results cannot be presented at this time.

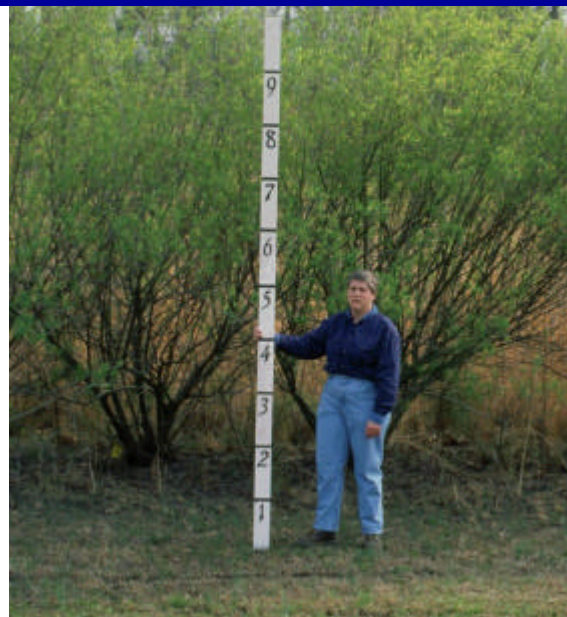
Future Projects and Plant Releases

Switch Cane and Giant Cane Planting Methods

We will be evaluating different propagation methods for switch cane and giant cane, two plants that can be used along field borders for erosion control and wild habitat and stream bank stabilization in urban and agriculture settings. The information gained from these studies will be shared with the Mississippi Band of Choctaw Indians to help in establishment and restoration of canebrakes on the reservation.

Using Native Species to Diversify Wetland Reserve Program Sites

A study, in cooperation with the Wetland Science Institute, to evaluate sculptured seeding of native grasses, wildflowers, and legumes will be planted this spring on approved WRP sites in Grenada and Quitman counties in Mississippi. Sites will be graded to provide a uniform slope up to the winter pool level and managed so that we can gather useful data as to which native plants survive and perform best in the various environments.



Willow to be Released in 2001

The PMC is going to release a tested class of willow called Morton germplasm this spring. This willow will be used to stabilize eroding stream banks, which is a major conservation need in our service area.

2000 Highlights



Technology from the Jamie L. Whitten PMC is an integral part of the NRCS strategic plan. The goals of providing a productive natural resource base and a high quality environment can not be realized without sound plant science technology. Technology transfer is the lifeblood of the PMC.

Written Technology Transfer

Type of Publication	Number
Technical and Progress Reports	8
Plant Guides and Fact Sheets	6
Symposia, Posters, and Papers	6
Posters	7
Technical Notes	2
Stand-alone Publications	2
Popular Articles	2
Total Publications	33

Oral Technology Transfer

Type of Presentation	Number
Tours	5
Local Presentations	6
Regional Presentations	2
National Presentations	8
International Presentations	2
Total Presentations	23

2000 Publications

Seed and Plant Vendors of Conservation Plants

This publication is a reference to assist conservationists in locating vendors of plant materials. It contains a list of seed and plant dealers by state, address, and telephone. Herbaceous and woody plants are sorted alphabetically by common name. There are 94 vendors and 176 species.

Eastern Gamagrass Technology Update

This publication contains papers that address essential issues relevant to the cultivation and production of eastern gamagrass and its use for livestock forage, erosion control and other conservation uses. The Eastern Gamagrass Technology Update was developed as a technology transfer tool to provide information to interested partners.

Looking for Information on Vegetative Solutions to Conservation Problems?

Visit the Plant Materials Program Website!
plant-materials.nrcs.usda.gov

- Plant Fact Sheets on conservation plants.
- Information on how to obtain conservation plants.
- Publications and technology development from 26 PMC's across the country.
- New improved plants uses and technology.
- Links to websites with additional or supporting information.