2007 Progress Report of Activities

East Texas Plant Materials Center

January 2008

6598 FM 2782 Nacogdoches, Texas Phone: 936.564.4873

Who We Are

The East Texas Plant Materials Center (ETPMC) is part of the Natural Resources Conservation Service (NRCS), United States Department of Agriculture. The ETPMC is a joint venture between Soil and Water Conservation Districts in east Texas and northwestern Louisiana, NRCS, Stephen F. Austin State University, and US Forest Service. The ETPMC is located at the Stephen F. Austin Experimental Forest near Nacogdoches, Texas. The Center has use of 75 acres. Currently 26 acres are being used for evaluation plots and seed production fields. The Center is currently working with the US Forest Service to obtain special use permits and open additional acreage for production fields and evaluation plots.

What We Do

The mission of the NRCS Plant Materials Program is to develop and transfer plant materials and plant technology for the conservation of natural resources. In working with a broad range of plant species, including grasses, forbs, trees, and shrubs, the program seeks to address priority needs of field offices and land managers in both public and private sectors. Emphasis is focused on using native plants as a healthy way to solve conservation problems and protect ecosystems. Center personnel also develop research projects and technical reports for use in developing technical guides for agency personnel and landowners on the use of plant materials in various conservation practices.

Priorities of the East Texas Plant Materials Center:

PMC activities are directed to develop plant materials and corresponding technology for the following seven high priorities:

- Erosion control and improvement of water quality and quantity
- Domestic livestock and wildlife food and cover
- Revegetation, water quality improvement and erosion control following timber harvests.
- Revegetation and stabilization of surface mined areas
- Stream bank stabilization and frequently inundated bottomlands
- Saline areas and high water table soils
- Wetland environments using adapted herbaceous and woody aquatic species

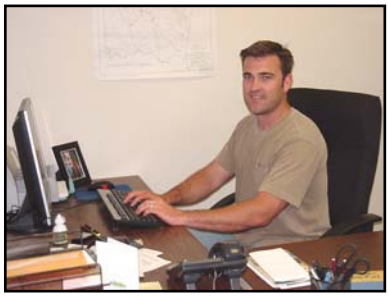
Service Area

The Plant Materials Center serves 48.2 million acres in east Texas and northwestern Louisiana. The topography is diverse ranging from level floodplains to strongly sloping forestlands and prairies. Soils in the service area range from deep, coarse textured sands to heavy clay bottomlands. Average yearly rainfall amounts vary from 32 inches to 56 inches near the Gulf coast. Humidity and temperature are usually high during the growing season. The average growing season ranges from 228 days to 260 days from north to south. The Center is one of 27 USDA, Natural Resources Conservation Service, Plant Materials Centers strategically located across the nation. Centers are located to serve areas with similar soils, plants, and climate.

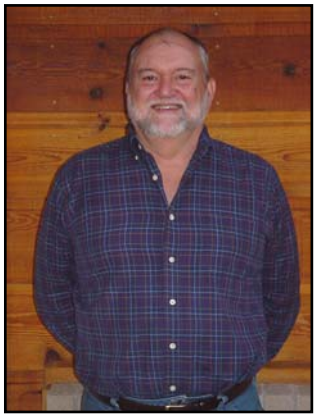
East Texas Plant Materials Center Staff

James Stevens – Plant Materials Center Manager
Alan Shadow – Soil Conservationist
Max McCormack – Biological Technician, Intermittent
Melinda Brakie – Assistant Manager
Tim Allen – Biological Technician (Plants)

Alan Shadow and Max McCormack Join PMC Staff in 2007



Alan Shadow, a native of Shreveport, Louisiana, earned an undergraduate degree in biochemistry from LSU-Shreveport in 1995. Alan was then employed by the LSU AgCenter Red River Research Station where he aided in conducting a water quality project using chicken litter and municipal waste for fertilization in cotton production and variety trials of agronomic crops. He transferred to LSU Baton Rouge, Louisiana and earned a Master of Science degree in Agronomy with a wetland management emphasis while working for LSU as a research associate. In 2005 he was hired by the USDA/NRCS Plant Materials Program under the Career Intern Program. He transferred to the Manhattan Plant Materials Center in Manhattan, Kansas and trained for 22 months before moving to the East Texas Plant Materials Program in April of 2007.



Max McCormack earned his undergraduate degree in Agriculture Education from Stephen F. Austin State University. Then attended Louisiana State University and earned a Master of Science degree in Animal Science. After graduating, he was employed as a conservation planner by the Soil Conservation Service for seven years at the Rusk Field Office. Afterward, he taught agriculture at New Summerfield High School for thirty-one years.

Progress Continues on Evaluation Area Expansion

The East Texas Plant Materials Center is currently working with the US Forest Service to expand the acreage available for evaluation and seed production activities. The original Memorandum of Understanding with the Forest Service allotted up to 75 acres for Plant Materials Center activities. Presently, twenty-six acres is being utilized by the PMC. During 2007, several steps were taken toward the expansion. An environmental assessment was completed by Kathy Duncan of the Forest Service. The completion of this assessment required several other steps including pre-cruise for timber volume, soils and wetland determinations, biological assessment, endangered species evaluation, archaeological survey, and boundary delineations.

Initial Evaluations

Melinda Brakie

Four native species, little bluestem, pinehill bluestem, splitbeard bluestem and gayfeather have been evaluated for the past two years. The objective is to select the best accessions from each collection for conservation cover, wildlife habitat, and range planting. In the fall of 2007, five accessions of split beard bluestem and little bluestem, three accessions of pinehill bluestem, and two accessions of gayfeather were chosen to move into advanced evaluations.

Harrison Florida paspalum Seed Germination Study

Melinda Brakie

Florida paspalum, (*Paspalum floridanum*), a perennial warm season grass is adapted throughout the eastern United States and utilized by wildlife for food and cover. In 2006, a germination study was conducted to examine the effect of prechilling and seed age on Harrison Florida paspalum germplasm. These seed lots had been in controlled storage from two to six years. The results showed a significant reduction in seed dormancy after three years of controlled storage. For 2007, a study of freshly harvested seed was conducted to determine the effect of ambient seed storage (room temperature) on seed dormancy. Results from the ambient germination test indicate seed dormancy is significantly reduced after nine months of ambient storage. Therefore, Harrison Florida paspalum seed could be harvested during the summer and be planted the following spring. This information would be helpful to commercial seed growers and NRCS personnel who provide seeding recommendations to landowners.

Seed Increase of Texas/Louisiana Little Bluestem Ecotype

Little bluestem is a native warm season grass suitable for forage and restoration. In 2005, the ETPMC began an initial evaluation of sixty-seven bluestem collections from Texas and Louisiana. In the fall of 2006, these collections were harvested for seed increase of a bluestem mixture suitable for the ETPMC service area. On April 27, 2007 a seed increase production block was established. Seed harvest of this ecotype should begin in 2008.

Switchgrass Biofuel Study

Alan Shadow

Native, warm season grasses, such as Switchgrass, are capable of producing tons of biomass annually. The ETPMC is currently conducting a field study to determine if cold season legumes can be used to supply the nitrogen inputs for 'Alamo' switchgrass to produce enough biomass for economical ethanol production. Four cold season legumes were chosen to use in the study, Austrian winter peas, 'Dixie' crimson clover, 'Apache' arrowleaf clover, and 'Patriot' white clover. Four control plots consisting of no legumes and 'Alamo' Switchgrass will also be included in the study. Soils samples were collected from the field before the legumes were planted. They will be used as a base line to compare future soils samples and monitor any improvements to soil fertility. Biomass will be harvested at the end of the growing season and be converted to tons per acre. It is hoped that some of the legumes might act as reseeding annuals and produce a renewable source of nitrogen and biomass for biofuel production.

Eastern gamagrass Axillary Study

Alan Shadow

From right: Alan Shadow and Daniel Peritte count axillary tillers.

Eastern gamagrass produces two sets of reproductive tillers, a single (primary) and several axillary (secondary) tillers. This study is a comparison between 3 cultivars of eastern gamagrass, 'Jackson', 'Medina', and # 9043629, and will determine the amount of seed set by the axillary tillers, the percent fill, and the percent germination for each of the three plant types. It is hoped to determine which plant is best suited for east Texas in terms of potential seed set, and to determine which seed harvest growers in this area should strive to harvest since the primary and axillary seed mature at different times.

Rust Resistant Indiangrass Screening

Alan Shadow

Rust, a common fungal pathogen, attacks many warm season grasses, decreasing productivity and increasing stress on the plant. The ETPMC recently screened through a collection of Indiangrass from the Native Prairie Association of Texas, NPAT. Many of the plants in this collection were highly susceptible to rust, however some of the plants exhibited little to no infection. The best twenty-three of the "resistant" plants were collected. Portions of the plant were dug up from the NPAT field and split in to 4, 5x5 inch plugs. This material was then planted into a new field in a completely randomized block design consisting of 4 replications. 'Lometa' Indiangrass and a severely

infected plant from the NPAT collection were added to the experiment as controls. A border of highly rust susceptible plants was planted around the experiment. This was done to eliminate edge effect and to ensure the rust pathogen was present in the newly established field. Data from this experiment will be analyzed to select a rust resistant plant for release in the ETPMC service area. The best material from this study will be kept in a breeding program for recurrent selection for vigor and resistance to the rust pathogens.

Intercenter Strain Trials

Melinda Brakie

Brownseed paspalum

The Plant Materials Center is conducting an Intercenter Strain Trial for brownseed paspalum and shortspike windmillgrass collections from the Kika de la Garza PMC at Kingsville, Texas. Brownseed paspalum grows in forest openings, along roadways, and firebreaks. Windmillgrass is found in the plains and sandy areas of Texas, Oklahoma, and New Mexico. The objective of this trial is to determine the best adapted collection of each species for this area. The evaluation plots were a randomized complete block design with four replications. Evaluations of plant survival, vigor, and seed production are completed each summer.

New PMC Release

Pilgrim velvet panicum germplasm was released in 2007. Velvet panicum, *Dichanthelium scoparium*, is a native perennial grass. This species grows throughout the South and is found on sandy areas. Some potential uses for Pilgrim germplasm include conservation cover for critical areas, wildlife food, and cover. It is a prolific seed producer with open panicle seed production in mid summer and closed panicle seed set in late fall.

Current PMC Releases

'Medina' eastern gamagrass,
'Jackson' eastern gamagrass
Crockett herbaceous mimosa select germplasm release
Harrison Florida paspalum select germplasm release

Tours and Presentations

Jim Stevens

Date	Title	Location
11/17/2006	Plant Materials Program Information	ETPMC
11/29/2006	Plant Attributes for Natural Resource Management	ETPMC
04/16/2007	Plant Materials Program Overview	ETPMC
04/21/2007	Information about Silvopastoral Practices	Maydelle, TX

Melinda Brakie

10/11/2006	Seed Germination of Florida paspalum	Fifth Eastern Native Grass Symposium
10/13/2006	N Usage by 'Medina' and 'Jackson' Eastern gamagrass	Fifth Eastern Native Grass Symposium
12/05/2006	Update on PMC Activities	ETPMC

Jim Stevens and Morris Houck (LaPMS)

08/21/2007	Native Plant Seed Collecting	Northeast Delta RC&D

PMC Staff, Rob Ziehr (TX PMS), Mike Stellbauer (Zone 4 Range Specialist)

07/18/2007	Plant Materials Program and Seed Collection	ETPMC

From right: Rob Ziehr (Texas State PMS) and MikeStellbauer, Zone 4 Range Specialist talk about the fertility requirements of native warm season grasses.

Angie Osborne, an NRCS employee at the Crockett Field office, examines a panicle of hairawn muhly during the training session.

Publications

Plant Fact Sheets

Plant Fact Sheet for Sea oats (*Uniola paniculata*) – Alan Shadow
Plant Fact Sheet for Splitbeard bluestem (*Andropogon ternarius*) – Melinda Brakie
Plant Fact Sheet for Velvet panicum (*Dichanthelium scoparium*) – Melinda Brakie

Pilgrim Velvet panicum germplasm release materials

Release Notice for Pilgrim Velvet panicum germplasm
Release brochure for Pilgrim Velvet panicum germplasm
Plant Guide for Pilgrim Velvet panicum germplasm

Other Publications

2006 East Texas PMC Technical Report – Melinda Brakie / Jim Stevens
2006 East Texas PMC Activities Progress Report – Jim Stevens / Melinda Brakie
Effect of Seed Age upon Germination of Harrison germplasm Florida paspalum – Melinda Brakie, Joel Douglas, Jim Stevens

The East Texas Plant Materials Center hosted several Natural Resources Conservation Service, US Forest Service, Texas Forest Service, and Texas Soil and Water Conservation District training and educational functions.
