

# EAST TEXAS PLANT MATERIALS CENTER

## *2012 Progress Report of Activities*

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## Study Update and Focus

### Cooperatives

The East Texas Plant Materials Center (ETPMC) is currently conducting two cooperative studies. Dr. Jim Kiniry of the Agricultural Research Service, Temple, Texas is using the ETPMC as one of ten locations across three states to evaluate warm season, perennial, grasses for biomass production and use in the cellulosic ethanol industry. This study will provide necessary information on which species and (or) varieties of grasses are best adapted to specific eco-regions allowing producers to choose the species/variety that will work best for their geographic location.

The ETPMC is also working with the Kika de la Garza Plant Materials Center, Kingsville, Texas to evaluate cold tolerance and adaptation of silver bluestem, four flower trichloris, Indian blanket flower, brownseed paspalum, and Florida paspalum. These evaluations will provide release information on seed fill, germination, and area of adaptation.



**Collecting biomass samples from ARS biofuel plots**

## Technology Development

### Rust Resistant Indiangrass

The rust resistant Indiangrass study was moved into its final phase in 2012. Seed collected from the F1 breeding block of five selected parents were harvested and planted into an F2 seed increase field. Plants were allowed to establish over the summer. Gaps in the stand will be filled in with seedlings from the same seed collection started in the greenhouse in 2013. The seed increase field will be monitored to ensure it retains the desired characteristics and disease resistance. The F2 field will generate seed for release after F3 generations are evaluated for performance and disease resistance.

### Evaluation of Lark Selection Partridge Pea in Long Leaf Pine Establishment



**Longleaf pine plots shortly after planting**

Complaints recently surfaced concerning the aggressiveness of Lark Selection partridge pea and its reduction of long leaf pine planting success. To evaluate these claims, four different seeding rates of Lark Selection and 'Comanche' partridge pea were used in a mix of native warm season grasses and evaluated in a randomized complete block design. Seeding rates for both partridge pea selections were 1, 0.75, 0.5, and 0.25 lb/acre, respectively. Control plots consisted of native warm season grasses only and plots with no grasses or partridge peas. Strips of long leaf pine were planted on Alazan Wildlife Management Area. The grass and

partridge pea mixtures were then planted in ten foot wide strips on either side of the longleaf pines. Establishment of the grasses and partridge peas was monitored throughout the summer; however, annual weeds from the seed bank out competed the grass/partridge pea seeding mixture resulting in no stand of the desired plant species and significant stand loss to the pines throughout the study. The test will be repeated again in the spring.

### Cover Crop and Soil Health

Soil health is a topic gaining national attention. To demonstrate the importance of soil health and the effect it has on commodity crops, the ETPMC has set up a dry land demonstration study comparing the use of no-till and cool season cover crops to conventional tillage for soybean production. One acre was planted to soybeans in the spring of 2012. The soybeans were harvested a half acre at a time at the end of the growing season and yield weights were recorded. One half acre plot was then no-till planted to a cool season, multi species cover crop, and the other half of the study was disked to turn under the crop residue and left fallow.



**Soybean commodity crop growing at the ETPMC, summer 2012**

This procedure will be repeated annually, and both half acre plots will be replanted to soybeans each spring. Soil samples, crop yield, and plant attributes will be compared over time to show the change in the soil structure between both plots and the benefits of a healthy, active soil matrix.

### Pollinator Planting

Nine commercially available wildflower mixes from five companies are currently being evaluated at the ETPMC for use in pollinator habitat improvement and to provide a diverse forb component to conservation plantings. Species adaptability and persistence has been monitored and recorded each year. The study is meant to increase efficiency of the ETPMC by identifying seed sources that are readily available for use in the ETPMC service area as opposed to developing new releases, and to provide useful information for technical guides and seeding tables used by NRCS field offices.



**Commercial wildflower seed mix plots growing at the ETPMC**

### Native Warm Season Grass Release Evaluation

To increase efficiency of release development, reduce duplication of plant releases, and develop information for field office planting guides; the ETPMC developed an adaptation study of commercially available releases of native, warm season, grasses from the southeastern United States. The study focuses on little bluestem, big bluestem, switchgrass, Indiangrass, and eastern gamagrass. It will evaluate each cultivar's performance and adaptation to the ETPMC Service area providing valuable information for the Texas NRCS planting standards. Planting of the study was delayed in 2012 due to precision grading work done on the site and lack of irrigation for stand establishment. Germination tests were run on all cultivars in the study to develop seeding rates that coincide with NRCS standards for each species.

## **University Cooperative Studies**



**Dr. Tom Miller from Rice University setting up field plots at the ETPMC**

In 2012 the ETPMC focused on developing partnerships with local universities. Five studies were developed and implemented, four with Stephen F. Austin State University and one with Rice University. The studies comprise of simulated silvopasture using both native and introduced warm season forage grasses; moist soil management and the cataloging of species found within the seed bank; identification of fungal pathogens affecting Indiangrass; the response of native and introduced cool season grasses to endophytes; and the response of native shrubs and trees used in shelter belts around poultry production facilities. These studies will yield information that can be added to field office practice standards.

## Center Improvement

In 2012 the ETPMC continued to make infrastructure and facility improvements. Forty acres of previously allocated and cleared land was precision graded and had engineered water ways constructed. The precision grading created more uniform fields for research, increased water infiltration by spreading surface flow over a broader area, and decreased surface erosion via run off. The precision graded fields, engineered water ways, and associated low water crossing on the field access road will also serve as training examples of conservation practices for use on tours and field days.

Irrigation was expanded from the existing fields to ten acres of the newly graded land. The irrigation system was designed by NRCS engineers and uses a permanent riser system. This system will increase efficiency by eliminating time spent moving irrigation pipe from field to field with the old system. The system will be expanded as funds allow.



**Precision grading new property and installation of engineered low water crossing at end of water way, seen inset.**



**Installation of permanent irrigation lines on new fields**

## Outreach, Presentations, and Tours

The ETPMC conducted 14 presentations and tours in FY 2012. Noteworthy tours included the SFASU soils labs and the 100 Farmers group, a minority based organization of local farmers. Presentations were given to the Nacogdoches Master Gardeners, Louisiana State University AgCenter's Red River Research Station's Field Day, Texas Seed Trade Association, and to participants of the Long Leaf Pine Alliance Field Day. The ETPMC has also partnered with the US Forest Service (USFS) and the Green Schools Garden Program. Native wildflowers and native grasses were grown and supplied to USFS Conservation Education Specialist, Tamberly Conway,



**Mr. Oscar Berrios and students show native wildflowers donated by the ETPMC for the Green Schools Garden Program**

for use in the American Forest Foundation Project Learning Tree Garden Schools' PollinatorLIVE! Gardens. The ETPMC served as a location for local schools' wildlife and woodland contests and hosted the Wheeling Sportsman Event for the USFS. The event received a national award from the National Wild Turkey Federation for Wheeling Sportsman Event of the year and involved multiple federal and state agencies as well as private conservation organizations and local landowners.

## Releases

'Nacogdoches' eastern gamagrass (*Tripsacum dactyloides*) was released as a cultivar in 2012. It will replace 'Medina' and 'Jackson' eastern gamagrass within the ETPMC service area. 'Nacogdoches' showed superior seed production when compared to 'Jackson' and 'Medina', with no loss in forage production or quality. Studies also showed it to be more disease resistant.

**Cajun Sunrise Germplasm** ashy sunflower (*Helianthus mollis*) was released cooperatively with the Golden Meadow Plant Materials Center and the Louisiana Native Plant Initiative. It has specific use for pollinator and wildlife habitat improvement and increased diversity in conservation plantings.

## Seed Increases

The ETPMC is currently increasing the following species:

- *Liatris pycnostachya* for release
- *Tridens strictus* for release
- *Helianthus mollis* cooperative release with Louisiana Native Plant Initiative
- *Schizachyrium scoparium* for the Louisiana Native Plant Initiative

## Collections

The ETPMC is currently requesting collections of the following species. Please see the web link for details: [http://www.tx.nrcs.usda.gov/technical/pmc/plant\\_collection\\_11.html](http://www.tx.nrcs.usda.gov/technical/pmc/plant_collection_11.html)

*Andropogon gerardii*

*Desmodium* sp.

*Ratibida columnifera*

*Polygonum pensylvanicum*

*Helianthus angustifolia*

*Echinochloa walteri*

## Endangered Species

In 2012 the ETPMC became involved with three endangered species, *Hibiscus dasycalyx*, *Leavenworthia texana*, and *Physaria pallida*. *H. dasycalyx*, Neches River Rose Mallow, is being grown from wild seed collected at multiple sites as a seed increase, and to gain insight on improving propagation and germination techniques. The Center for Plant Conservation, through the Mercer Arboretum and Anita Tiller, has asked for help in developing



**Neches River Rose Mallow bloom and characteristic leaves seen in inset.**

improved germination and propagation techniques of White Bladder Pod, *Physaria pallid*, and Golden Glade Crest, *Leavenworthia texana*.

## Publications

The ETPMC produced 17 new technical documents and newsletters during FY 2012. These documents include updated release brochures for all ETPMC plant releases, Technical Notes, Plant Guides, and Plant Fact Sheets. For a complete list of publications past and present, please see:

<http://plant-materials.nrcs.usda.gov/etpmc/publications.html>

## Plant Materials Staff

Alan Shadow – Center Manager

Michael Woody – Biological Technician

Melinda Brakie – Soil Conservationist

Max McCormack – Biological Aide

## Who We Are

The East Texas Plant Materials Center (ETPMC) is one of 27 centers operated by the Natural Resources Conservation Service (NRCS), United States Department of Agriculture. The ETPMC services 42 million acres and covers portions of Texas, Louisiana, Arkansas, and Oklahoma. The center was established in 1982 and is a joint venture between Soil and Water Conservation Districts in east Texas and northwestern Louisiana, NRCS, Stephen F. Austin State University (SFASU), and US Forest Service. The ETPMC encompasses 75 acres of research and production fields, and is located in the Stephen F. Austin Experimental Forest, south of Nacogdoches, Texas.

## What We Do

The mission of the NRCS Plant Materials Program is to develop and transfer effective 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 NRCS field offices and land managers in both public and private sectors. Emphasis is focused on using native plants to solve conservation problems and to protect and restore ecosystems. Center personnel 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. The ETPMC's area of emphasis includes, but is not limited to:

- Enhancement of water quality through the protection of riparian and wetland areas
- Restoration of degraded pasture, range, and timber lands
- Restoration of surface-mined sites
- Wildlife habitat improvement
- Restoration of saline sites associated with the oil and gas industry
- Improvement of air quality as related to poultry and other livestock industries

## Contact Information

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