

East Texas Plant Materials Center

Year 2009 Progress Report of Activities



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Current Studies

Seed Production Comparison of Three Eastern Gamagrasses in East Texas

Study Leader: Alan Shadow

2009 marked the third and final year of data collection for this study, and the results are favorable for the release of accession 9043629, Nacogdoches, to replace 'Jackson' and 'Medina'. Nacogdoches, showed significant increases in the number of reproductive tillers when compared to 'Jackson' and 'Medina'. This was also reflected with significantly higher seed yields. There were no significant differences detected for seed quality parameters between the three eastern gamagrasses. Previous work has shown no differences in forage values between Nacogdoches, 'Medina', or 'Jackson'. However, Nacogdoches has shown better growth response at lower fertility rates than 'Medina' or 'Jackson' in previous studies. All of these factors are good news for commercial seed producers and the ETPMC looks forward to releasing Nacogdoches in the near future.

Adaptation of Prairie acacia, Panicked tickclover, and Crockett germplasm herbaceous mimosa

Study Leader: Melinda Brakie

This study is a joint effort between Texas Agrilife Research, USDA/NRCS Plant Materials Centers in Texas, Homer Louisiana Experiment Station, and The Noble Foundation at Ardmore, Oklahoma. There is a need to include more species of native herbaceous legumes in seed mixes in the southern Great Plains. These seed mixes are used for rangeland restoration, native prairie reconstruction, and wildlife habitat restoration. Three selections of prairie acacia from Knox City, Texas Plant Materials Center, Texas Agrilife Research, and Kingsville, Texas Plant Materials Center are being tested along with panicked tickclover and Crockett germplasm herbaceous mimosa from the East Texas Plant Materials Center.



Above: On the left is a seed production subplot and on the right is a forage production subplot.

2009 Activity

Forage and seed samples were harvested from each plot during the growing season. These samples were sent to the Agrilife Research Station in Stephenville, Texas to be analyzed for nutrient quality.

Effects of Cold Season Legume N fixation on 'Alamo' for Switchgrass Biofuel/Biomass Production

Study Leader: Alan Shadow

With the current interest in using warm season, native grasses as biofuels, the ETPMC set out to evaluate the use of four cool season legumes to supply nitrogen input for the production of 'Alamo' switchgrass. Growth of the four legumes was monitored throughout the spring. Crimson clover and ball clover performed very well. Crimson clover was the first to mature, followed by hairy vetch, ball clover, and arrowleaf clover. It was noted that hairy vetch smothered the switchgrass, drastically reducing the stand. Arrowleaf clover produced a large amount of biomass and was quite capable of keeping up with the switchgrass in terms of height. It grew nearly 4 feet in height before going to seed. However, all but one plot lodged, partially smothered the switchgrass stand in late April 2009. The study will be harvested after the first killing frost of 2009, and the biomass will be weighed and converted to dry matter yields for comparative analysis.



Dr. Leon Young of Stephen F. Austin State University and his soils class on a field trip at the ETPMC. Currently Dr. Young is searching for a graduate student to collaborate on this study by conducting forage analysis on the legumes and switchgrass, and monitoring soil fertility and its changes based on treatments.

Rust Resistance Screening of Indian Grass

Study Leader: Alan Shadow

Staff at the ETPMC noted significant infections of rust, a fungal plant pathogen, in the Native Prairie Association of Texas's (NPAT) collection of Indiangrass growing at the center. Moderate to heavy rust infections tend to weaken plant stands and make them less productive. Mortality can become an issue when the infection is coupled with other environmental stressors such as drought. These factors make the plant less competitive, and can eventually lead to stand reduction or loss in extreme cases. Some plants with in the NPAT collection seemed to be more resistant to the pathogen and showed little signs of infections. These individuals were identified, and transplanted into a study for evaluation. The study is in its third year, and selections are being made for more advanced evaluations and use as crossing parents for a breeding program to develop a locally adapted Indiangrass with resistance to rust. Paul Gray, a graduate student at Stephen F Austin State University, was recently added to the study. Paul, with the help of Dr. Jo Taylor, will be using electron microscopy to evaluate and identify any

physical plant characteristics that might aid the plant's resistance to the pathogen. The advanced evaluation breeding block is scheduled to be planted in the spring of 2010.

Screening of NPAT Switchgrass Collection for Forage and Biofuel Potential

Study Leader: Alan Shadow

The ETPMC recently screened through a large collection of switchgrass made by the Native Prairie Association of Texas, and has started an initial evaluation of plants that exhibit favorable attributes. Plant growth and nutrition data will be collected from this study over a 3 year period to find a locally adapted cultivar with good forage and biofuel production potential. The properties that make a plant good for cellulosic ethanol production tend to decrease its forage value. Having a plant that has good forage value as well as



biofuel properties would give local producers more options with their crop. Should there be any delays in the development of ethanol production facilities, the producer would have the option to graze the switchgrass or cut it for hay. The goal of this study is not to find the best biofuel producing plant or the best forage plant, but one that meets in the middle of the road with properties that make it suitable to both applications.

Seed Increase of Gayfeather (*Liatris sp.*)

Study leader: Melinda Brakie

Gayfeather species inhabit open to moderately timbered sites. Pollinators, such as butterflies and bees, are attracted to this plant. Currently, the Plant Materials Center is increasing seed of collection #9067351 (Kansas gayfeather) from Montgomery County, Texas. This collection is a tall, robust plant with purple flowers along the length of the stem.

2009 Activity

In the spring the seed increase block was enlarged with more transplants. Eight and a half pounds of bulk seed was harvested in the fall of 2009.



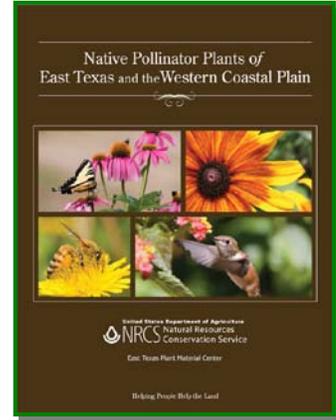
Above: Collection #9067351 in June. Some stems were close to six feet tall.



Above: One of the fifteen species of butterflies observed in the seed increase block.

New Publication

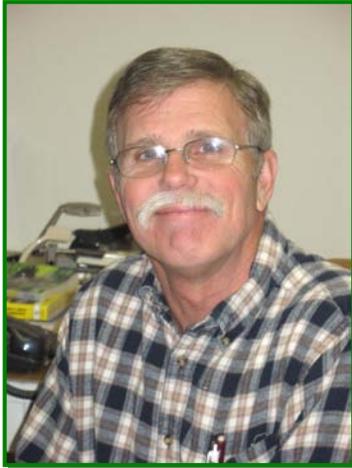
The East Texas Plant Materials Center has a new pollinator publication entitled "*Native Pollinator Plants of East Texas and the Western Coastal Plain*". The brochure was written by Alan Shadow and gives information including bloom time, bloom color, fertility and light requirements about twenty common plant species found in the region. Copies are available from the East Texas Plant Materials Center.



Plant Materials Staff

Jim Stevens – Plant Materials Center Manager
Melinda Brakie – Soil Conservationist
Michael Woody – Biological Technician
Alan Shadow – Soil Conservationist
Max McCormack – Biological Aide

New Biological Technician



Michael Woody was selected as the Biological Technician for the East Texas Plant Materials Center in September. He graduated from Eastern Oklahoma College with an Associate Degree of Science in Forest Technology. Michael was employed in the timber industry for 30 years. He enjoys gardening and woodworking in his spare time.

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 (SFASU), and US Forest Service. The ETPMC is located at the Stephen F. Austin Experimental Forest near Nacogdoches, Texas.

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.



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