



2014 Progress Report of Activities East Texas Plant Materials Center Nacogdoches, Texas

Final Reports

2014 saw 6 projects finalized at the USDA-Natural Resources Conservation Service East Texas Plant Materials Center (ETPMC) at Nacogdoches, Texas. These projects included the screening of local Indiangrass ecotypes for rust resistance, evaluation of local ecotypes of switchgrass for biofuel production and forage quality, the evaluation of local ecotypes of little bluestem and Echinacea, the evaluation of 9 commercial wildflower mixes for rapid pollinator habitat enhancement, and a seed storage study on Harrison Germplasm Florida paspalum. Information and results collected during the studies have been organized into final reports accessible through the ETPMC website. Selected germplasm from studies and evaluations will be stored in small foundation plots at the ETPMC for use in future projects as needs arise.

Study Update

Native Warm Season Grass Evaluation

The ETPMC initiated a study in 2013 to evaluate the performance and adaptation of native, warm season, perennial grasses for conservation use. The evaluation focuses on commercially available, cultivar level releases of big bluestem, little bluestem, switchgrass, and Indiangrass released through the USDA NRCS Plant Materials Centers in the southeastern United States. The first round of data was collected in 2014 and consisted of plant height, seed maturity dates, disease susceptibility rankings, percent stand, and forage yields. The first clipping for forage yield evaluation was taken approximately 60 days after spring recovery by harvesting the forage from half of each plot to a height of 6 inches to simulate a hay cutting or grazing event. The other half of the plot was harvested after first frost to assess season long production and the regrowth from the 60 day harvest. In addition to forage production, forage



Little Bluestem plots regrowth shortly after half the plot was harvested to simulate a grazing or hay cutting event

quality estimates of crude protein and digestibility are being determined to inform field offices and interested producers of the quality of these grasses.

Shelter Belts for Controlling Particulate Matter, Ammonia, and Odor from Poultry Buildings

This study was planted in 2012 as a cooperative effort between the ETPMC and Dr. Sheryll Jerez from Stephen F. Austin State University. It will evaluate the effectiveness species: arborvitae, Arizona cypress, roughleaf dogwood, eastern red cedar, American holly, yaupon, and wax myrtle for reducing particulate matter, ammonia, and odor from exhaust areas of poultry production houses. Baseline measurements for ventilation rates per poultry house, air speed from exhaust fans, tree measurements, particulate matter concentrations, concentrations of ammonia, hydrogen sulfide, and odor were collected in 2013 and analyzed in 2014. Trees not surviving the initial planting were replaced in 2014 to maintain a continuous buffer across the portion of the house containing the exhaust fans. This is an ongoing study to monitor survival, growth and efficiency of the aforementioned trees and shrubs. .



Nasal Ranger Field Olfactometer being used to measure the odor-dilution-to-threshold ratio upwind and downwind of the poultry houses

Quality and Yield of Seven Forages Grown Under Partial Shading of a Simulated Silvopastoral System in East Texas

This three year study began in 2012 to determine the effects of shade on the growth and production of seven forage grasses: ‘Tifton 85’ bermudagrass, ‘Tifton 9’ bahiagrass, ‘Americus’ Indiangrass, ‘Kaw’ big bluestem, ‘Alamo’ switchgrass, ‘Nacogdoches’ eastern gamagrass, and Harrison Germplasm Florida paspalum. Treatments consisted of zero and 50% shade created by wooden slats suspended from PVC frames. Plots were harvested on two week intervals to simulate intensive grazing. Native grass species were clipped to an 8 inch height while bermudagrass and bahiagrass were clipped to 4 inches.



Shaded and unshaded plots for native and introduced forage grass species seen in the silvopasture study at the East Texas Plant Materials Center in 2014

Forages were harvested and analyzed for dry matter yield, plant height, crude protein, neutral detergent fiber, acid detergent fiber, *in vitro* true digestibility (NIRS only), and elemental composition.

Data from 2013 suggests shade didn't affect any of the forages or measured parameters except for height. Shaded plants, excluding eastern gamagrass and switchgrass, were taller in stature. Forage production under 50% shade was similar to the open areas receiving full sunlight. 'Kaw' big bluestem and 'Tifton 9' bahiagrass were the highest yielding forages. In 2014, 'Alamo' switchgrass, Harrison Germplasm Florida paspalum, and 'Nacogdoches' eastern gamagrass ranked among the most productive forages. Shade only slightly reduced yields in Harrison Germplasm Florida paspalum and 'Nacogdoches' eastern gamagrass. 'Alamo' switchgrass has shown high yields in both sun and shade, as well as persistence under intensive defoliation. 'Nacogdoches' eastern gamagrass appears to exhibit some shade tolerance, but persistence is questionable based on visual observations of the plant's health. It is anticipated due to frequent clipping is the reason for the decline in stand and vigor. Early results showed that shade improved forage quality overall. This study will continue in 2015.

Plant Materials Staff

Alan Shadow – Center Manager
Melinda Brakie – Soil Conservationist
Max McCormack – Biological Aide

Who We Are

The East Texas Plant Materials Center (ETPMC) is one of 25 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 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.

Contact Information

Address: 6598 FM 2782, Nacogdoches, Texas 75964
Phone: (936) 564-4873 Fax: (936) 552-7924
Web Address: <http://plant-materials.nrcs.usda.gov/ETPMC>

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