



2022 Progress Report of Activities East Texas Plant Materials Center Nacogdoches, Texas

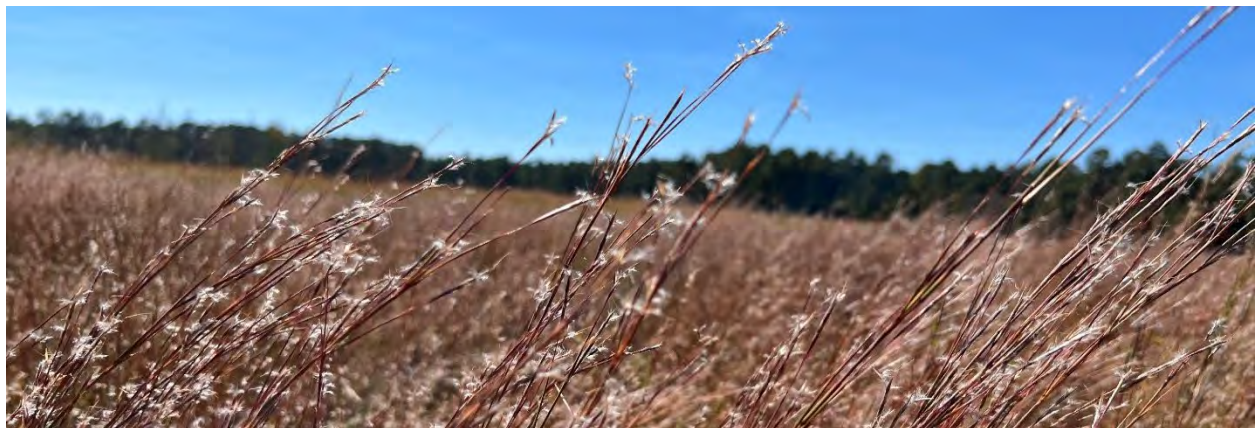
Plant Release and Evaluations Update

The East Texas Plant Materials Center (ETPMC) continues a successful partnership with the Texas Native Seeds (TNS) Program's East Texas Natives Project in developing plant releases for eastern Texas, southern Arkansas, and western Louisiana. Plant releases focus specifically on understory restoration in longleaf and shortleaf pine systems, as well as grassland and prairie restoration in disturbed sites including pasture, cropland, pipelines, and highway rights-of-ways. All accessions are evaluated in replicated plots in multiple locations throughout Texas, including four sites in Texas NRCS Zone 4. Current Plant Materials Program releases are used as controls in all evaluations, if commercially available.

Silver bluestem, *Bothriochloa laguroides*, will be the first cooperative release with the ETPMC and TNS. This species was selected for evaluation based on its widespread distribution and its ability to function as a pioneering species on disturbed sites. Ninety silver bluestem accessions were evaluated for conservation attributes and four were selected for seed increase based on superior germination, seedling vigor, field survival, vegetative growth, and harvestability. Evaluations were completed in 2022 and official release is scheduled for late 2023. Plants are currently in seed increase, and seed will be available to commercial growers in 2024 in limited quantities.

Purpletop tridens, *Tridens flavus*, is entering the first year of seed increase after completion of evaluations at multiple sites in east Texas and the coastal prairies region, where four selections were made from 123 regional collections. A plant release is anticipated in 2024.

Statewide evaluations of **yellow Indiangrass**, *Sorghastrum nutans*, collections showed one accession outperforming all other accessions and controls in multiple locations. Accession 91104590 from Hood County, Texas, and 'Lometa', the top performing control in previous work, have been selected for an adaptation study to determine area of use in Texas. Year one evaluations of **roundleaf thoroughwort**, *Eupatorium rotundifolium*, and **longspike tridens** (*Tridens strictus*) collections were completed in east Texas and the coastal prairies in 2022. **Blue mistflower**, (*Conoclinium coelestinum*) evaluations will begin in 2023.





Research Activities

Observational Plantings of PMC Germplasm

The ETPMC is participating in observational plantings of existing conservation germplasm releases with six other USDA-NRCS Plant Materials Centers. The participating centers have service areas within the historic range of shortleaf and longleaf pine forests. These open pine systems are some of the most ecologically diverse and important habitat in the world and have drastically declined due to commercial logging and replacement with faster growing loblolly pine. The purpose of this study is to determine the area of adaptation of exiting releases to broaden their area of use in conservation plantings. This increases the conservation footprint of each release, increases efficiency in the Plant Materials Program, provides more options for NRCS Conservation Planners in conservation plantings, and makes the releases more marketable for commercial producers.

This evaluation tests for adaptation and performance over multiple years, and tests existing and new releases from participating Centers. Data collection will include survivability, height, vigor, cold and drought tolerance and disease and insect resistance. The study will be completed in fall of 2026. Results of the study will be used to update the following conservation practice standards: Contour Buffer Strips (332); Conservation Cover (327); Field Borders (386); Vegetative Barrier (601); Upland Wildlife Habitat Management (345); and Filter Strip (393).

PMCs involved include Jamie L. Whitten PMC, Coffeetown, Mississippi; Jimmy Carter PMC, Americus, Georgia; Brooksville PMC, Brooksville, Florida; Elsberry PMC, Elsberry, Missouri; Booneville PMC, Booneville, Arkansas; and Appalachian PMC, Alderson, West Virginia.

Switchgrass

- Tusca
Espresso
Robusto
'Alamo'

Eastern gamagrass

- 'Nacogdoches'
Sunrise Germplasm
WVPMC Germplasm
'Highlander'

- Virginia wildrye –
Roundstone source

Other grasses

- USFS Pinehill bluestem
Neches Germplasm
splitbeard bluestem
Harrison Germplasm Florida
paspalum
Pilgrim Germplasm velvet
rosette grass

Big bluestem

- Supremo
Refuge Germplasm
OZ-70 Germplasm
'Rountree'

Indiangrass

- Excelso
'Americus'

Little Bluestem

- Cappuccino
Coastal Plains Germplasm
'Aldous'

Wildrye

- Copiah Germplasm
southeastern wildrye
Coahoma Germplasm
southeastern wildrye
'Kinchafoonee' Virginia
wildrye

Forbs

- Crockett Germplasm
herbaceous mimosa
Cajun Sunrise Germplasm
ashy sunflower
Pineland Gold Germplasm
ashy sunflower
Pineywoods Germplasm
thickspike gayfeather





Wildflower Seeding Rate Study

A wildflower seeding rate study was initiated at Caddo Mounds State Historical Site to determine if the current seeding rate recommendation of 20 PLS seeds/sq ft needs revision for NRCS Texas Zone 4, given the excessive weed pressure and rainfall in the eastern part of the state. A native wildflower mix was formulated using nine native forb species including golden Alexander, lance-leaf coreopsis, spotted beebalm, bergamot, rattlesnake master, ashly sunflower, roundleaf thoroughwort, rough goldenrod and white wingstem and was combined with a 20% native grass component consisting of four native grass species including Coastal Plains Germplasm little bluestem, pinehill bluestem, Harrison Germplasm Florida paspalum and 'Lometa' indiangrass. Four rates consisting of 15, 20, 30 and, 40 PLS sq ft were planted in a randomized complete block design in 420 sq ft plots on March 29, 2022. Heavy rains ensued within the week of planting, and follow-up observations 30, 60 and 90 days after planting showed no seedling emergence. The study will be replanted in January or February of 2023.



Planting the wildflower seeding rate study at Caddo Mounds.

Evaluation of Cool Season Cover Crop Seeding Rates

The ETPMC conducted its final year of the cool season cover crop seeding rate trial of 'AU Merit' hairy



Harvesting a sample of cool season cover crops to measure biomass.

vetch, common vetch (VNS), and 'Frosty' berseem clover, 'Wyo' winter pea, and 'Dixie' crimson clover for biomass production. Legumes were planted at $\frac{1}{4}$, $\frac{1}{2}$, full, and 1.5 times the recommended seeding rate with a secondary plot containing 'Wrens Abruzzi' cereal rye with the legume component to compare biomass of the legumes with and without the cereal rye. Results from the study will be used to update seeding rate recommendations for cover crop (340) and other conservation practice where these legumes are recommended for resource conservation programs. This study is complete and is in

the data analysis stage. Initial results show lower seeding rates of most legumes failed to provide adequate cover and biomass and were outcompeted by the cereal rye.

Collecting Temporal Plant Growth Characteristics of Single and Mixed Cover Crop Species for Conservation Planning Tools

The ETPMC completed its first year of a single cover crop species for conservation planning tools to document growth of black oats ('Soil Saver') and black seeded oats ('Cosaque') from seedling emergence to termination to provide conservation planners a more complete picture of cover crop growth characteristics and progression. This study is providing plant growth characteristics for conservation planning tools such as the Revised Universal Soil Loss Equation (RUSLE2) and the Water Erosion Prediction Project (WEPP).



United States Department of Agriculture

Public and Partner Outreach



ETPMC Manager Alan Shadow harvests switchgrass for the Caddo Mounds grass house rebuilding project.



The recently rebuilt grass house at Caddo Mounds State Historical Site.

The ETPMC staff completed nine rainfall simulation demonstrations to diverse audiences, including state and federal agencies (NRCS, USFS, TFS, TPWD and TFA), forest landowners, forestry professionals, municipal water district personnel, and area elementary through college students. The demonstration was presented offsite at the Longleaf 101 Academy, Pineywoods SWCD 6th Grade Conservation Day, Caddo Mounds Prairie Day, Texas Forestry Association and the Texas Forests and Water Forum.

Collaboration with the Caddo Nation continues as building materials were grown and harvested at the ETPMC to rebuild the grass house at Caddo Mounds State Historical Site in Alto, Texas, after the previous house was destroyed in a 2019 tornado. ETPMC staff assisted members of the Caddo Nation, volunteers, and State Historical Site staff in harvesting switchgrass fields for this purpose. The ETPMC continues to provide technical assistance in expanding the prairie restoration effort at Caddo Mounds State Historical Site, and more than 70 acres are in various stages of native grass prairie restoration. Additionally, ETPMC staff are in the process of consulting on river cane expansion plantings on the property. ETPMC Study Leader Dawn Stover led a demonstration for Caddo Mounds Prairie Day showing the rainfall simulator demonstration and making native forb and grass seed balls with participants.



ETPMC Study Leader Dawn Stover demonstrating the rainfall simulator.

ETPMC staff hosted the American Youth Works (AYW)- Texas Conservation Corps Tribal Youth Conservation Corps Crew, working under a partnership with the USFS Southern Region and completing work on the National Forests and Grasslands in Texas (NFGT) (Angelina-Sabine Ranger District). Youth from the Alabama-Coushatta Tribe completed a service work and educational day by planting heirloom tobacco from the Muscogee (Creek) Nation at the center. The youth were also given a rainfall simulator demonstration and were led on a tour of the ETPMC research fields and production facilities, as well as a nearby, privately owned, fire-managed longleaf pine forest.



American Youth Works students planting heritage tobacco. *Photo courtesy of Ina Bullock, American Youth Works – Texas Conservation Corp Crew Leader*



United States Department of Agriculture



Volunteers potting Kentucky lady's slipper orchids in the ETPMC greenhouse.

The ETPMC partnered with the USFS and Stephen F. Austin State University (SFASU) to provide facility resources and technical assistance with a rare plant reintroduction effort for Kentucky lady slipper orchids (*Cypripedium kentuckiense*) in the Sabine National Forest. PMC staff, SFASU horticulture faculty and graduate students, and local volunteers potted more than 400 orchid seedlings that were grown in the ETPMC greenhouse.

Who We Are

The ETPMC is one of 25 centers operated by the United States Department of Agriculture Natural Resources Conservation Service (NRCS). 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, SFASU, and US Forest Service.

Manager: Alan Shadow

Agronomist/Study Leader: Dawn Stover

Biological Technician: vacant

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 conducts studies and prepares technical documents 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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