



### Cooperative Studies and Outreach

The ETPMC, in an effort to increase its conservation footprint and technology development, is partnering with local universities to develop and facilitate graduate level studies. The partnerships have been mutually beneficial for the ETPMC and universities. The ETPMC is able to increase its work load and technology output, and the universities have access to new greenhouse facilities, a variety of field equipment, irrigation, and safe field space close to the universities; constantly monitored by PMC staff. Active projects at the ETPMC include a simulated silvopasture study conducted by master's student Jodi Hill from Stephen F. Austin University (SFASU). Jodi's work will monitor the effects of different shade regimes on warm season, introduced and native forage grasses. Dr. Tom Miller from Rice University is studying native and introduced cool season grasses and their response to fungal endophytes. The fungal endophytes confer benefits to host grasses through their production of alkaloids, which can enhance the host's drought tolerance or herbivore resistance. Understanding how endophytes function could allow the development of plants with increased drought tolerance or lower toxicity to grazing animals by managing the endophytes. Mike Winston is working with SFASU on assessing the existing seed-bank for moist-soil management on the upper Texas coast by monitoring soil samples in the greenhouse under 3 separate watering regimes, flooded, moist, and dry. The plants that emerge are identified and recorded which will generate a species list and their percentage in the samples. Madison Nelson, also through SFASU is following up work done by Paul



Jodi Hill and her research assistants pot up warm season grasses for her silvopasture study.

Gray under Dr. Jo Taylor and is identifying fungal pathogens that attack Indiangrass. Lastly, Dr. Sheryll Jerez from SFASU will head a study in conjunction with the PMC that is aimed at developing functional shelter belts to improve air quality from poultry house. Her study will monitor species response to the adverse conditions surrounding poultry house exhaust fans and measure the air improvement of each design.

## Warm Season Cover Crops

Working with state conservation agronomist Willie Durham, the ETPMC has started a year-round cover crop rotation on all fallow areas to improve soil health. A large scale demonstration has been planted to showcase the advantages of cover crops. The demo will monitor a soybean commodity crop under conventional tillage and no-till cover crop system in a side by side comparison. The demo will be harvested, yields recorded, and plotted on a graph over time.



Rolling down sun hemp and lab lab cover crop with close up seen in inset photo



No-Till planting fall cover crop into warm season vegetative mat from roll down.

Soil health is a topic pertinent to all and is gaining interest across the nation. Too often the soil has been thought of as an inert growing media that we amend to produce crops. In actuality the soil is a complex interaction of mineral particles, bacteria, fungi, organic matter, and benthic organisms which form a cyclic system of decomposition, nutrient cycling, and renewal. When functioning properly, soil needs few, if any, amendments and water infiltration is greatly increased. Water infiltration is especially important in periods of drought allowing plants access to moisture that infiltrates and is held in the surface layers of the soil matrix instead of running off the fields during rainfall events. Decreased

surface runoff produces healthier watersheds and less erosion, both of which contribute to healthier ecosystems. Soil should be thought of as a living system and the first step in producing a healthy environment. Maintaining growing vegetation on the soil surface is essential to healthy soils, and has led to the development of multi-specie cover crop mixes for all seasons of the year. Warm season cover crop species at the ETPMC consisted of sun hemp, joint vetch, iron and clay peas, lab lab, forage soybeans, and buckwheat. Lab lab and sun hemp mixtures did exceptionally well and produced massive amounts of biomass that rolled down easily. The lab lab is capable of climbing the sun hemp, which can

reach upwards of 10 feet in years with average rainfall. 2013 will see the addition of tall grasses such as Egyptian wheat, forage sorghum, and Sudan grass as well as sunflowers in the cover crop mixes.

## Conservation Practice Demonstrations and Plant Training

Expansion of the ETPMC fields has presented the opportunity to develop functional demonstration sites for conservation practices. Such practices include Conservation Cover, Cover Crops, Critical Area Planting, Filter Strips, Grassed Waterways, Precision Land Forming, Irrigation Systems Subsurface and Surface, and Stream Crossing. Others may be possible as the land is developed further. These practices will be designed, installed and maintained, marked with signage and used as examples to train new employees and the public on conservation practices found within the ETPMC service area.

Viewers will learn how they look in the field and how they function. A small site at the entrance to the fields is being dedicated to developing a plant identification training area. Staff will collect major native grasses, forbs, and legumes found within the ETPMC service area and plant them with signage so that field office staff, trainees, students, and the public can have a convenient area to learn to identify important native plant species.



Hydromulching waterways in new fields with Bahia grass for rapid establishment of grassed waterways to facilitate drainage and minimize erosion



Creating an engineered low water crossing where the water way in the new field crosses a road in the Experimental Forest

## Seed Collections

Please remember to mail in seed collections of Pennsylvania smartweed (*Polygonum pennsylvanicum*), swamp sunflower (*Helianthus angustifolius*), and ticktrefoil (*Desmodium* sp.) to the East Texas Plant Materials Center. Thank you to the NRCS offices which have submitted their collections.



Ticktrefoil seed (photo courtesy of K.R. Robertson, Illinois Natural History Survey)

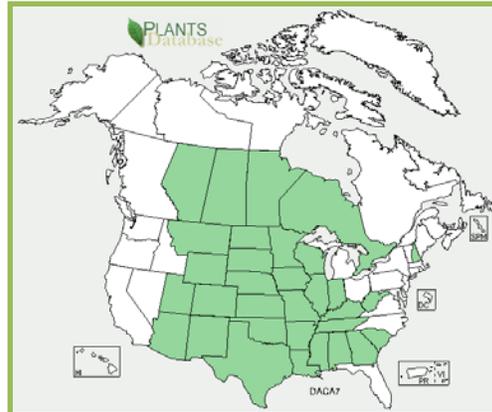


Swamp sunflower seed, Steve Hurst @ USDA-NRCS Plants Database

## Featured Plant – White Prairie Clover (*Dalea candida*)



Typical flower of white prairie clover, courtesy of John Hilty at Illinois Wildflowers



Distribution of white prairie clover, courtesy of Plants Database

White prairie clover is a native, warm season, perennial legume characterized by slender, pale blue/green foliage, and white to pale purple flowers. Flowering starts at the bottom of the seed head and progress upward as the seed head

matures. The seed heads are typically longer than those found on its close relative, purple prairie clover. It is a very important plant for wildlife. The blooms are very attractive to a variety of pollinating insects and it is highly palatable to all classes of livestock and grazing/browsing large game such as deer and elk. It was used medicinally by several tribes of Native Americans to treat wounds, and the roots were chewed for their sweet flavor. White prairie clover has a very pleasing, aromatic scent when handled and its hardiness makes it an excellent choice for xeriscaping and other landscape applications.

### Who We Are

The USDA Natural Resources Conservation Service (NRCS) collects, selects and releases plants and develops plant technology to address our nation's most critical soil and water problems through the agency's Plant Materials Program. The East Texas Plant Materials Center in Nacogdoches, Texas serves east Texas, western Louisiana, southwest Arkansas, and southeast Oklahoma. The Plant Materials Center is a partnership between the NRCS, US Forest Service, Stephen F. Austin State University, and Soil and Water Conservation Districts in east Texas and western Louisiana.

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