



Year 2000 Progress Report of Activities



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Who We Are

The James E. "Bud" Smith Plant Materials Center (PMC) at Knox City, Texas, was established in 1965 and is one of 26 Centers located throughout the United States. The Center is responsible for developing conservation plants and cultural techniques for use on targeted Major Land Resource Areas (MLRA) in Texas and Oklahoma.

The area served in Texas includes all or portions of nine MLRAs ranging in size from 800,000 acres to over 23 million acres. The area served in southwestern Oklahoma comprises parts of five MLRAs in 27 counties totaling over 16 million acres.

The Center is located approximately 4 miles NW of Knox City, Texas, in the Rolling Red Plains Land Resource Area.

The mission of the Plant Materials Program is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. Plant and technology development objectives of the Knox City PMC include:

- Erosion Control - wind and water
- Range and Pasture Improvement
- Wildlife Habitat Improvement
- Water Quality

Following is a highlight of some of the activities of the Knox City PMC for 2000.



Saving North Texas Blackland Prairies

Of the thousands of original acres of Texas Blackland prairies, today less than 5000 acres remain.

The Nature Conservancy (TNC) acting through its North Texas Field Representative recognized the need to preserve and increase certain species of native plants of its Clymer Meadow preserve near Greenville, Texas.

It was the TNC objective to increase local ecotypes of common prairie grass that could be used to revegetate disturbed lands within the preserve. TNC wanted to also make locally adapted ecotypes available to other landholders in the area (Northern Blackland Prairie). Local landholders would then have a source of locally adapted grasses to plant whenever seeds were needed.

The Knox City Plant Materials Center (PMC), having a common interest with TNC, entered into

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an agreement in 1999 whereby the PMC would increase big bluestem, switchgrass, Indiangrass, eastern gamagrass, and little bluestem collected in the Clymer Meadow Area. During the first two years of the agreement seed collection at the preserve has been light due mainly to the extensive drought across north Texas. After two years of limited production the PMC has in field increase eastern gamagrass and switchgrass. Collections of big bluestem, Indiangrass and little bluestem have produced little or no viable seed.

As the agreement continues to develop and additional collection are made and increased, local ecotypes will become more available.

Conservation Plants for the National Park Service

Back in 1989 the National Park Service and the Knox City Plant Materials Center (PMC) entered into an agreement whereby the PMC would collect and increase certain native plants growing within parks and provide seeds/plants back to the Parks for use on roadside revegetation projects.

From its inception the PMC has worked with three National Park Service Sites including Big Bend National Park, Chickasaw National Recreation Area, and Lake Meredith National Recreation Area.

Although roadside revegetation following road construction has always been the primary use of materials produced by the PMC, the Parks have also utilized materials to renovate picnic grounds, landfills, building construction sites and burned areas. The program provides the NPS a cost-effective means of acquiring and maintaining the genetic integrity of materials being planted into the parks.

Currently for Chickasaw National Recreation Area the PMC is producing 5 different native grass species, 12 different woody species, and several native wildflowers. Seeds and plants that are produced will be planted in areas adjacent to road construction and within renovated picnic grounds.

Project work for Big Bend National Park is currently in a hold/maintenance phase at the PMC.

Big Bend is in a planning phase pending additional funding.

Reclaiming Twin Buttes Dam, San Angelo, Texas

Twin Buttes Dam, approximately six miles southwest of San Angelo, extends across the South Concho River, Spring Creek, and the Middle Concho River. Built in 1963, the dam is 134 feet above the Middle Concho riverbed, and a crest length of 8.34 miles. Twin Buttes Reservoir, when full, holds 640,000 acre-feet of water and covers 37 square miles.

Officials from the City of San Angelo (City) asked the Bureau of Reclamation (BOR) for help controlling erosion of the dam 1996. In January of 1997 the City, BOR, and Natural Resources Conservation Service (NRCS), Plant Materials personnel conducted an on-site reconnaissance with a team of specialists. Gullies, some six feet deep, had formed on the ten-foot thick caliche cap originally placed on the face of the earthen dam.

The interdisciplinary team surveyed the damages, evaluated the soils, and inventoried the sparse-growing vegetation. Various methods of stabilization were discussed, including “hard”, mechanical fixes such as concrete or gravel blankets versus “softer” soil bioengineering concepts. The team recommended setting up demonstration trials of some of the proposed solutions. Study trials would be monitored over a period of time to determine their success and applicability. Due to the size of the project (8.75 miles) the cost of stabilization would weigh heavily in the choice of treatments that could be used to stabilize the entire dam.

Listed below are the four treatments selected for installation in the winter of 1997 and spring 1998.

- Erosion control blankets rolled into “bio-logs” at intervals of approximately 15’.
- Seeded to grass, forbs, and legumes and protected with erosion control blankets.
- Vegetative barriers of 'Alamo' switchgrass planted across slope at 15’ intervals.

- Strips 6' wide scarified & seeded at 15' intervals across the slope.

The scarified and seeded treatment was installed on December 8, 1998. The city then leveled out the gullies and pushed the sediment back up on the dam in preparation for the other treatments installed the week of March 22-26, 1999.



Five reviews were conducted by NRCS, with BOR and City representatives present, from May 24, 1999 to June 15, 2000. The final report was completed in late summer of 2000.

At the conclusion of the study it was recommended to the City that the seeding and erosion control blanket alternative method be the choice for future stabilization work. Vegetative barriers using 'Alamo' switchgrass proved applicable but the hand labor required for installation and maintenance is not readily available to the City. Bio-logs made of the erosion control blankets can be successful but require almost as much hand labor to install as the vegetative barriers and much more maintenance is needed to keep them functional. Simply scarifying the surface in strips and seeding did prove to be a viable treatment method.

Select Germplasm Releases for 2000

Early in FY 2000 the Knox City PMC released five new selection for use in CRP, EQIP, WHIP, and WRP.

Plants were releases as selected ecotype releases and will not have a cultivar name assigned. Each selection will be recognized by a name reflective of its collection location.

San Marcos Germplasm eastern gamagrass

was originally collected 1964 from native plants located in Hays County, Texas near the town of San Marcos.

San Marcos

Germplasm may be used in pure stands for

improved pasture and hay plantings or as a component in seed mixtures for range seeding. Its forage value is highly palatable to all livestock and must be managed accordingly to avoid overgrazing. Wildlife can utilize the plants and seed for food. The plants provide good ground nesting cover for quail. San Marcos Germplasm maybe utilized in filterstrips, field borders, contour buffer strips, cross wind trap strips, and riparian forest buffers for nitrogen and phosphorus uptake, and erosion control.



Potter County Germplasm spike dropseed

was originally collected in 1984 from native plants located in the Canadian River bottomland approximately 18 miles north of Amarillo in Potter County Texas. Potter County Germplasm may be used in pure stands or as a component in seed mixtures for range seeding and conservation reserve plantings. Spike dropseed reseeds itself readily on ranges following overgrazing or drought. It may be used for stabilizing sandy soils that have high erosion potential. Its forage value is fairly palatable to all livestock. Wildlife can utilize the plants for food and ground nesting cover.

Borden County Germplasm sand dropseed

was originally collected in 1984 from native plants located approximately 12 miles west of Gail, TX in Borden County. Borden County Germplasm may be used in pure stands or as a component in seed mixtures for range seeding and conservation reserve plantings. Sand dropseed reseeds itself readily on ranges following overgrazing or drought. It may be used for stabilizing sandy soils that have high erosion potential. Its forage value is fairly palatable to all livestock. Wildlife can utilize the plants for food and ground nesting cover.

Duck Creek Germplasm Texas dropseed was originally collected 1982 from native plants located along an intermittent stream flowing into Duck Creek north of Spur in Dickens County Texas. The potential use of Duck Creek Germplasm is for range seeding and revegetation on disturbed or damaged sites that have saline problems. Texas dropseed may be used in areas where alkali sacaton and fourwing saltbush is adapted. Mostly in low, moist, somewhat saline or alkaline areas or adjacent to oil wells sites almost denuded of vegetation.

Kerr Germplasm Wright pavonia was originally collected by RC Malden and sent to the old SCS San Antonio Nursery in the early 60's. After the nursery closed the germplasm was moved the Waco, TX and later to the Knox City PMC in 1966. Seed produced at Knox City PMC from the original germplasm was used to establish a native population at the Texas Parks and Wildlife - Kerr Wildlife Management Area near Hunt, TX. Kerr

Germplasm may be used in pure stands or as a component in seed mixtures for range seeding. Wright pavonia reseeds itself readily on rangeland where the plants are protected from



overgrazing. It may be used for beautification and low input native landscapes. Its forage value is highly palatable to all livestock, white-tailed deer and many exotic herbivores. Wildlife will utilize the plants and seed for food. Plants used in perennial food plots for white-tailed deer will have to be protected and managed using limited access areas.

Perennial Native Food Plots for White-tailed Deer

With the rise in intense deer management programs land managers have several decisions to make when it comes to deer nutrition. These decisions can have an effect on the success or failure of an operation. Land managers often wonder what to plant, is it providing quality nutrition to the animals, and is it economically feasible.

Perennial food plots using high quality native forbs, legumes, and woody shrubs can provide large amounts of forage to animals. If installed and properly managed perennial food plots can provide economic, quality forage on a year round time schedule.

The Plant Materials Center has released several improved forbs, legumes and woody shrubs that can be used in the establishment of perennial food plots. Although known to be nutritious and beneficial, additional site and animal use data was needed. In 1998 four sites were established in prominent white-tailed deer management areas. The data compiled from the evaluation of each site will be used to make additional recommendations on the establishment and usage of perennial plants in deer food plots and as a basis for future plant development and enhancement.

Evaluation sites included:

- TPWD - Kerr Wildlife Mgmt. Area - Hunt, TX
- North Concho River Ranch - San Angelo, TX
- Scott Ranch - Beeville, TX
- Cherry Creek Ranch - Comfort, TX



Select species established at each site:

- 'Eldorado' Engelmann daisy
- 'Plateau' awnless bushsunflower
- 'Sabine' Illinois bundleflower
- 'Yellow Puff' littleleaf leadtree
- 'Comanche' partridge pea
- 'Aztec' Maximilian sunflower

In year 2000 the site at Kerr WMA is established and giving some data. All sites have had trouble

with establishment due to drought conditions the past three years. The site at Comfort, TX had the best establishment but was lost due to management. Year 2001 is looking good as related to rainfall. Future plans involve continuing to work with landowners in the establishment and management of each site.

Native Grass Species Adapted to Deep Sands and Sand Dunes

The Plant Materials Center is in the process of evaluating three grass species that are adapted for use on sandy soils. These three grasses giant sandreed, sand bluestem, and Havard panicum all have characteristics that will make them useful in the revegetation and stabilization of sandy soils.

Giant sandreed, *Calamovilfa gigantea* a native, perennial, warm-season grass beneficial for reducing soil erosion on deep sands subject to severe wind erosion. Due to its aggressive rhizomatous root system it is not only good for stabilizing sand dunes, but also for sediment trapping on cropland. Giant sandreed can be used in CRP and other conservation practices such as contour buffer strips, field borders on cropland, and rangeland seeding in sandy areas. This grass provides good habitat and some food for wildlife. It reproduces from seeds and rhizomes and will grow into large colonies, sometimes dominating a site.

Giant sandreed cures well and providing good summer and winter forage for livestock. Large plantings can be cut for hay. It is best adapted in deep sands and sand dunes in the Central Rolling Red Plains and Southern High Plains of Texas and Southern Oklahoma.

Sand bluestem, *Andropogon hallii* is a native, perennial, warm-season grass that grows principally on sandhills and in deep sandy soils in the Central Rolling Red Plains and Southern High Plains of Texas and Oklahoma. Sand bluestem replaces big bluestem on sandier soils in western Texas and SW Oklahoma. This grass species can be planted in pure stands or as a component in a seed mix. Possible uses of sand bluestem include CRP or EQIP planting on sandy soils, dune stabilization,



herbaceous wind barrier, rangeland improvement, and pasture or hayland plantings.

Havard panicum, *Panicum havardii*, is a native, perennial, rhizomatous warm-season grass that is adapted to the Trans-Pecos and Southern High Plains. Havard panicum grows in dry sands and is usually found in and around sand dune. This plant resemble switchgrass in general appearance, except that stems and leaves of Havard panicum are blue-green and tend to grow singly rather than in tight bunches. The seed heads are long and open and seeds are nearly twice the size of switchgrass. Colonies of Havard panicum may spread 30 feet or more in a good season.

In areas of adaptation Havard panicum is good for grazing and fair for wildlife habitat. Palatability of Havard panicum declines as stems mature in the summer.

Havard panicum is adapted for use on sites with active sand dune. It may be used as a component in CRP, EQIP, and range seeding mixes when developed for deep sands. It is adapted for use in conservation practices such as contour buffer strips, field borders, and vegetative hedges.

Cool-Season Grass Growing at PMC

Cooperative with Dr. James Read from the TAMU Research and Extension Center at Dallas the PMC has over the last three years been working out some of the seed production technology associated with Texas bluegrass, *Poa arachnifera*.

Dr. Read for several years made Texas bluegrass collections from the North and Central Texas Area with plans on releasing a native cool-season grass to replace or supplement small grains in winter livestock grazing systems in certain areas of Texas.



Texas bluegrass a cool-season, rhizomatous, perennial grass fit the profile with forage quality (palatability and protein content) equal to that of small grain.

Although primarily developed as a replacement for small grains in winter grazing systems, Texas bluegrass has other uses such as a lawn grass, plantings along highways and roadside parks, and golf courses. Texas bluegrass can be used in areas where shade tolerance is a factor.