



2003  
Annual Technical Report  
James E. 'Bud' Smith  
Plant Materials Center  
Knox City, Texas

May 2004



**2003 Annual Technical Report  
James E." Bud" Smith Plant Materials Center  
Knox City, Texas**

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## INTRODUCTION

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.

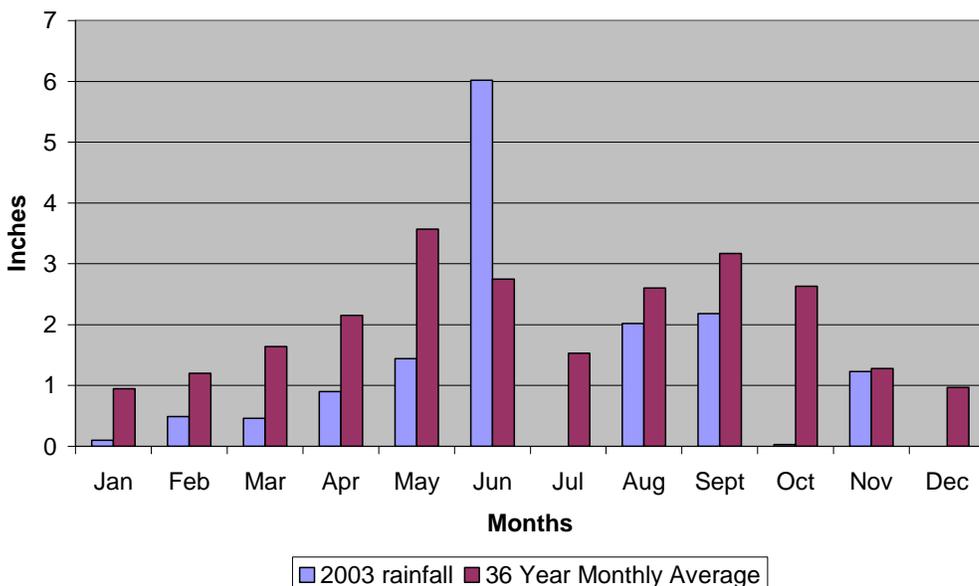
The area served in Texas includes all or portions of nine MLRAs ranging in size from 800,000 acres to over 23 million acres. The area served in southwestern Oklahoma comprises parts of five MLRAs in 27 counties totaling over 16 million acres.

The Center is located approximately 4 miles NW of Knox City, Texas, in the Rolling Red Plains Land Resource Area. The site is located about 33 degrees north latitude, 100 degrees west longitude and 1500 feet above sea level. The facility includes 137.5 irrigated acres. Irrigation water is supplied by eight shallow irrigation wells. All wells are connected to an underground plastic pipeline for distribution to each field.

Approximately 90 percent of the soil at the PMC is a friable loam or fine sandy loam. Surface soil varies in depth from 10 to 30 inches with sandy clay loam or clay subsoil. The remainder of the soil is slightly heavier, having a fine sandy loam surface soil over clay loam subsoil with a caliche layer between 20 and 36 inches. Water erosion is not usually a problem but wind erosion poses a constant threat, especially during late winter and spring. On fallow fields, cover crops and tillage practices are employed to control wind erosion.

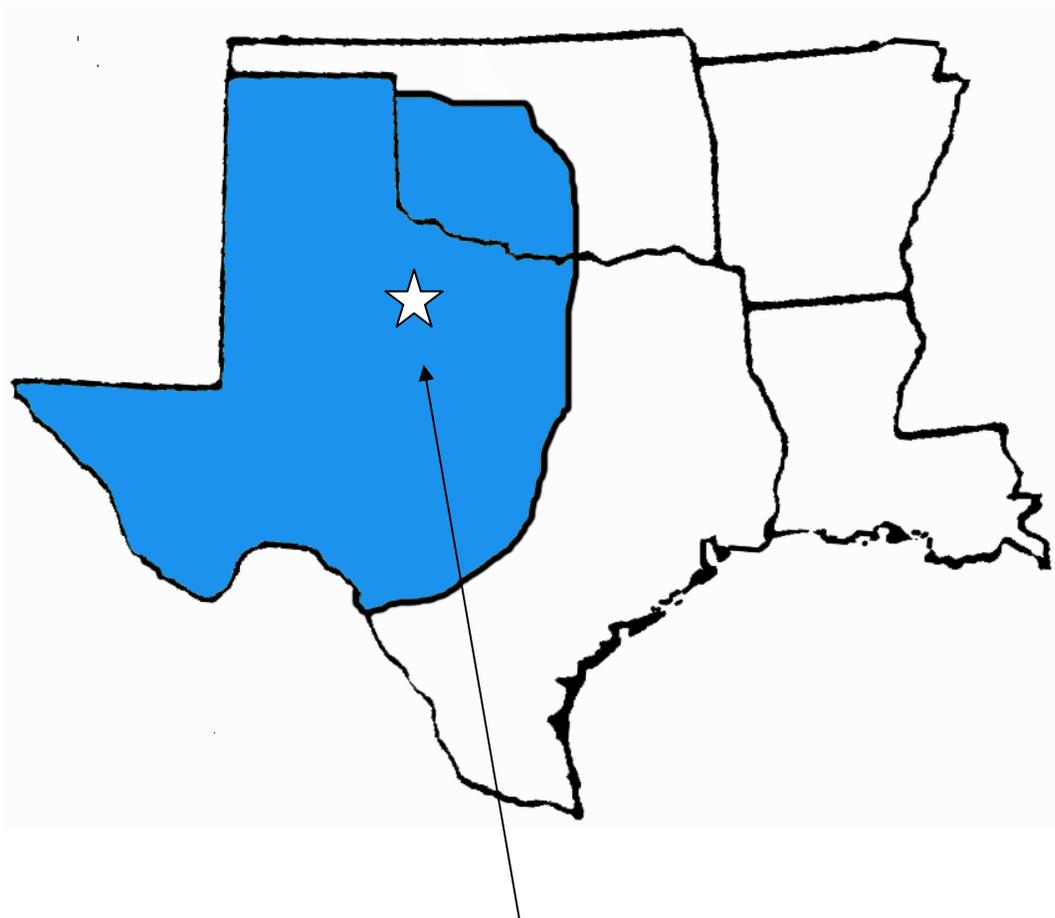
The Knox City PMC has a long term average of 230 frost-free days in its growing season. Rainfall for 2003 was recorded at 14.87 inches, which is 9.57 inches below the 36-year average of 24.4 inches. Precipitation for the Center is mainly received in the form of spring, summer and fall rain showers. Snowfalls during winter are few and contribute minor amounts to total rainfall.

**KCPMC 2003 Rainfall Data**



## SERVICE AREA

The primary service area of the Knox City Plant Materials Center includes a large portion of Texas and Southwestern Oklahoma. The work done here is coordinated with that being done at other Plant Materials Centers in Texas and throughout the United States. The map below indicates the area of responsibility for the James E. "Bud" Smith Plant Materials Center.



James E. "Bud" Smith Plant Materials Center  
Knox City, Texas

# KNOX CITY PLANT MATERIALS CENTER LONG RANGE PLAN

## I. Introduction

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. The purpose of the Plant Materials Program is to carry out specialized activities in resource conservation, as part of the overall program of the Natural Resources Conservation Service. It is the responsibility of the Plant Materials Center to: 1) assemble, test, and release plant materials for conservation use, 2) determine techniques for the successful use and management of conservation species, 3) facilitate the commercial increase of conservation species, 4) provide for the development and transfer of state of the art applied science technology.

The PMC Long Range Plan is used to identify, guide, and direct PMC operation toward solving high-priority resource problems identified in the State(s) Plant Materials LRP. **The Knox City PMC is directed by needs identified in the Long Range Plans of Texas and Oklahoma, and is consistent with goals and objectives identified in the NRCS Strategic Plan.**

## II. Long Range Plan Development

This long range plan was developed in accordance with the revised National Plant Materials Manual, Part 540.22. This plan is intended to be used as a guide for directing plant materials center activities within the states of Texas and Oklahoma.

The Plant Materials Center Technical Advisory Committee(s) is responsible for identifying customers, resource, and program needs. The Technical Advisory Committee consists of representatives from NRCS and other federal and state agencies, private industry, and universities. Advisory members may have an interest due to financial contributions made to the center.

Needs were categorized by the NRCS Goals and Objectives as listed in the revised National Plant Materials Manual, Exhibit 539.30 NRCS Goals and Objectives.

The Technical Advisory Committee recommends studies needed at the center to meet identified concerns. Specific study areas and special concerns are defined by the Technical Advisory Committee and reviewed by the State Conservationist Advisory Committee. Projects budgeted are incorporated into the Center's Business Plan and Workload Analysis

### General Description of the Service Area

Climate - USDA Plant Hardiness Zones 6,7,8 are within the area served. Rainfall is quite varied both in annual amount and in seasonal distribution, but predominately occurs in the form of rainfall. Annual precipitation averages of individual climatological stations range from about 8 to 36 inches.

Major Land Resource Areas - Included in the service area is all or portions of six major land resource areas. MLRAs include the following:

- 77A, B, C - Southern High Plains
- 78A, B, C, D - Central Rolling Red Plains
- 80A - Central Rolling Red Prairies
- 80B - North Texas Central Prairies

- 81 - Edwards Plateau
- 82 - Texas Central Basin
- 84A - Cross Timbers
- 84B - West Cross Timbers
- 84C - East Cross Timbers
- 85 - Grand Prairie
- 86A - Northern Texas Blackland Prairies

A detailed description of MLRAs, land use, and climate may be found in the reference "Land Resource regions and Major Land Resource Areas of The United States", Agricultural Handbook 296.

### **III. NRCS Objectives, Needs, Recommended Actions**

The plant material needs of the Knox City PMC fall into five categories according to NRCS Objectives:

#### **NRCS Objective: 2.1 Healthy and productive cropland sustaining U.S. agriculture and the environment.**

##### **A. Plant selection and cultural technique development for stabilization of soils that have high erosion potential.**

Problem:

Plant materials are needed that have the innate ability to establish and maintain themselves on sandy soils and control wind erosion. Three major land resource areas in Oklahoma and sixteen MLRA's in Texas are affected, resulting in a total of 4.7 million acres needing attention.

Objective:

To identify, collect, develop technology, and cooperatively release plant selections and techniques for the stabilization of sandy soils with high erosion potential.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:

- 'Mason' sandhill lovegrass
- 'Alamo' switchgrass
- 'Rainbow' wild plum
- 'Lometa' Indiangrass
- 'Haskell' sideoats grama
- 'Sabine' Illinois bundleflower
- 'Comanche' partridge pea
- 'Van Horn' green sprangletop
- 'Earl' big bluestem
- Potter County Germplasm spike dropseed
- Borden County Germplasm sand dropseed
- Cottle County Germplasm sand bluestem

OK Select Germplasm little bluestem  
Hondo Germplasm velvet bundleflower  
Cuero Germplasm purple prairie clover

Current plant science studies:  
Evaluation of giant sandreed  
Evaluation of western indigo  
Evaluation of prairie acacia  
Evaluation of Havard panicum

## **B. Woody species for wind erosion control and wildlife habitat.**

Problem:

Adapted woody plant materials that are easily established, fast growing and long-lived are needed for windbreaks. In addition to erosion control, windbreaks will provide wildlife habitat and enhance beautification of the landscape. Nine major land resource areas in Texas and five in Oklahoma are involved.

Objective:

To identify, collect, develop technology, and cooperatively release plant selections and techniques for use in windbreak planting and design.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:

'Rainbow' wild plum  
'Yellow Puff' littleleaf leadtree  
'Boomer' bur oak  
Kerr Germplasm Wright pavonia

Current plant science studies:

Evaluation of white honeysuckle  
Evaluation of little walnut  
Woody CFT Evaluation (Knox City, Levelland, Pampa) - inactive

## **Objective 2.2 Healthy watersheds providing clean and abundant water supplies for people and environment.**

### **A. Ground cover vegetation for critically eroding areas to reduce soil loss and improve water quality.**

Problem:

There is a need for plant materials and techniques for stabilization of critically eroding areas. All major land resource areas in both states totaling approx. 2.5 million acres are affected need vegetative treatment.

Objective:

To identify, collect, develop techniques and cooperatively release adapted vegetation for stabilization of critically eroding areas.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases:

'Texoka' buffalograss  
'Alamo' switchgrass  
'Aztec' Maximilian sunflower  
'Rainbow' wild plum  
'Saltalk' alkali sacaton  
'Haskell' sideoats grama  
'Sabine' Illinois bundleflower  
'Comanche' partridge pea  
'Van Horn' green sprangletop  
'Overton R18' rose clover  
'Earl' big bluestem  
Potter County Germplasm spike dropseed  
Borden County Germplasm sand dropseed  
Duck Creek Germplasm Texas dropseed  
Cottle County Germplasm sand bluestem  
Hondo Germplasm velvet bundleflower  
Cuero Germplasm purple prairie clover

Current plant science studies:

Evaluation of western indigo  
Evaluation of Texas bluegrass  
Evaluation of prairie acacia  
Evaluation of Havard panicum  
Evaluation of halfshrub sundrop  
Interagency Agreement - Big Bend National Park  
Interagency Agreement - Chickasaw National Recreation Area  
Native Planting for Wildlife in Urban Settings - inactive

**B. Plant selection and cultural techniques for saline and/or alkaline soil conditions.**

Problem:

There is a need for adapted plant materials, which are tolerant of saline and/or alkaline soil conditions. All major land resource areas in Texas and four in Oklahoma, totaling more than 1.2 million acres, are affected by different levels of salinity or alkalinity that are either naturally occurring or induced by oil field related activities. (See respective long-range Plant Materials Programs - Oklahoma and Texas).

Objectives:

To identify tolerant materials and techniques for saline or alkaline sites by:

---testing known cultivars for their adaptability.

- collecting and evaluating plants from site reviews.
- evaluating techniques needed to enhance establishment.
- releasing adapted plant and techniques.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Previous Releases:

- 'Selection 75' kleingrass
- 'Alamo' switchgrass
- 'Aztec' Maximilian sunflower
- 'Lometa' Indiangrass
- 'Saltalk' alkali sacaton
- 'Haskell' sideoats grama
- Potter County Germplasm spike dropseed
- Borden County Germplasm sand dropseed
- Duck Creek Germplasm Texas dropseed

Current plant science studies:

- Evaluation of Havard panicum
- Evaluation of prairie cordgrass
- Technical Evaluation of alkali bulrush

**Objective 2.3 Healthy and productive grazing land sustaining U.S. agriculture and the environment.**

**A. Species selection and cultural technique development needed for the enhancement of water quality, improvement of range and pastureland and to promote food and cover for wildlife.**

Problem:

There is a need for commercially available adapted plant materials indigenous to the climates of Texas and Oklahoma. All major land resource areas in both states, totaling approx. 45 million acres, need treatment with locally adapted plants.

Adapted species are needed to help improve water quality, provide forage for wildlife during critical periods and provide food/cover for wildlife.

Objective:

To identify, collect, develop and cooperatively release grasses, forbs, legumes and woody species adapted to Oklahoma and Texas.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Previous releases

- 'Selection 75' kleingrass
- 'Mason' sandhill lovegrass

'Alamo' switchgrass  
'Aztec' Maximilian sunflower  
'T-587' old world bluestem  
'Rainbow' wild plum  
'Lometa' Indiangrass  
'Yellow Puff' littleleaf leadtree  
'Saltalk' alkali sacaton  
'Haskell' sideoats grama  
'Sabine' Illinois bundleflower  
'Comanche' partridge pea  
'Plateau' awnless bushsunflower  
'Van Horn' green sprangletop  
'Overton R18' rose clover  
'Earl' big bluestem  
Kerr Germplasm Wright's pavonia  
San Marcos Germplasm eastern gamagrass  
Cottle County Germplasm sand bluestem  
OK Select Germplasm little bluestem  
Hondo Germplasm velvet bundleflower  
Cuero Germplasm purple prairie clover

Current plant science studies:

Evaluation of sweet Indianmallow

Evaluation of western indigo

Evaluation of white honeysuckle

Evaluation of Texas bluegrass

Evaluation of half shrub sundrop

Evaluation of prairie acacia

Nutritional Evaluation of Perennial Species for Deer Food Plot

## **Objective 2.4 Healthy and productive wetlands sustaining watersheds and wildlife.**

### **A. Wetland vegetation selection and cultural techniques for water quality improvement.**

Problem:

There is a need for plant materials and techniques that are adapted for water quality use. All major land resource areas in both states are affected and need adapted species. Urban and rural wastewater treatments, streambank stabilization and drinking water quality improvement are major concerns in the area.

Objective:

To identify, collect, develop techniques and cooperatively release adapted vegetation for water quality improvement.

Procedure:

Previous released species, assemblies under evaluation, and cultural studies will be evaluated at the center and at selected off-center sites.

Released Plant Materials

'Alamo' switchgrass

'Aztec' Maximilian sunflower  
'Rainbow' wild plum  
'Haskell' sideoats grama  
'Sabine' Illinois bundleflower  
'Comanche' partridge pea  
'Van Horn' green sprangletop  
'Earl' big bluestem  
San Marcos Germplasm eastern gamagrass

Current plant science studies:  
Evaluation of western indigo  
Evaluation of prairie acacia  
Evaluation of prairie cordgrass  
Technical evaluation of bushy bluestem  
Technical evaluation of purpletop tridens

Planned collections and studies.  
Technical Evaluation of alkali bulrush  
Technical Evaluation of waterwillow  
Technical Evaluation of sawgrass

**Objective 2.5 High-quality habitat on private land supporting the Nation's wildlife heritage.**

1a, 3a, 4a address this objective.

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<b>Study Number and Name:</b> 48I117S Evaluation of western indigo
<b>Study Objective:</b> Evaluation and release of selected accessions of western indigo.

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<b>Study Number and Name:</b> 48I134H Evaluation of sand bluestem
<b>Study Objective:</b> Evaluation and release of selected accessions of sand bluestem.

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<b>Study Number and Name:</b> 48I136K Evaluation of little walnut
<b>Study Objective:</b> Evaluation and release of selected accessions of little walnut.

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<b>Study Number and Name:</b> 48I140H Evaluation and Release of Little Bluestem
<b>Study Objective:</b> Increase and release of selected accession of little bluestem

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<b>Study Number and Name:</b> 48I156H Evaluation of giant sandreed
<b>Study Objective:</b> Evaluation and release of selected accessions of big sandreed.

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<b>Study Number and Name:</b> 48I171K Evaluation of white honeysuckle
<b>Study Objective:</b> Evaluation of selected species for wildlife use

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<b>Study Number and Name:</b> 48I179B Native Plants for Big Bend National Park
<b>Study Objective:</b> Increase and production of native plants and seeds for BBNP.

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<b>Study Number and Name:</b> 48I183B Native Plants for Chickasaw National Recreation Area
<b>Study Objective:</b> Native plant and seed production for CNRA

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<b>Study Number and Name:</b> 48I187J Evaluation of Indianmallow
<b>Study Objective:</b> Evaluate and release selected accessions of Indianmallow

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<b>Study Number and Name:</b> 48I188S Evaluation of halfshrub sundrop
<b>Study Objective:</b> Evaluation and release selected accessions of halfshrub sundrop

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<b>Study Number and Name:</b> 48I190S Evaluation of Havard's panicum
<b>Study Objective:</b> Evaluation and release of selected accessions of Havard's panicum.

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<b>Study Number and Name:</b> 48I192S Evaluation of prairie acacia
<b>Study Objective:</b> Release of selected accessions of prairie acacia.

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<b>Study Number and Name:</b> 48I193S Technical evaluation of prairie cordgrass
<b>Study Objective:</b> Release of tech. information on the production and use of prairie cordgrass.

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<b>Study Number and Name:</b> 48I195S Evaluation of bushy bluestem
<b>Study Objective:</b> Evaluation and release of bushy bluestem for wildlife habitat in wetlands.

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<b>Study Number and Name:</b> 48I196S Evaluation of purpletop tridens
<b>Study Objective:</b> Evaluate and release accessions of purpletop for wildlife habitat

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**Study Number and Name:** 48I199S Evaluation of waterwillow

**Study Objective:** Evaluate potential of using waterwillow for wetlands.

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**Study Number and Name:** 48I200S Evaluation of sawgrass

**Study Objective:** Evaluate the potential use of sawgrass for wetlands in TX

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**Study Number and Name:** 48I201S Evaluation of alkali bulrush

**Study Objective:** Eval. the potential release of alkali bulrush for saline wetlands in west TX.

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**Study Number and Name:** 48I202J Nutritional Eval. of Perennial Species for Deer Food Plots

**Study Objective:** Evaluate perennial species for deer food.

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**Study Number and Name:** 48I203J Native Plants for Wildlife in Urban Settings

**Study Objective:** Demo of native plant use for wildlife in urban setting

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Study: 48I117S Assembly of Information in the Release of PI 477963 Western indigo

Objective: To document information for release of PI 477963 western indigo to be used as a forage legume in range mixtures in West Central Texas.

Project Plan – Since 1983, field plantings of western indigo including PI477963 had been conducted at 10 locations in Texas. During the 5-year period, not one of the plantings obtained a successful stand.

Supplement #1- In the spring of 1988 a ground preparation with a seeding mix of PI-477963 western indigo, 'Haskell' Sideoats grama, '29926T' Little bluestem, 'Lometa' Indiangrass and '441106' Green sprangletop were planted in the north end of R block at the Plant Materials Center. West side non-scarified western indigo seeds and east side scarified western indigo seeds. Irrigation vs non-irrigation for both non-scarified and scarified seeds were applied. Results were that of the western indigo there were more plants of western indigo per square foot of non-scarified seeds on irrigated and non-irrigated than scarified seeds on irrigated and non-irrigated plots.

On May 27, 1992, 13 accessions of Western indigo assembled and planted at the Plant Materials Center to be evaluated. This included PI 477963 which is 04134T, also. These accessions were evaluated for % germination, early green-up, uniform growth, vigor and survivability. So far the top two were PI - 477963 and 9002528, respectively.

Summary: Evaluations will continue to identify which accession produces substantial seed amounts, and has a uniform growth and recovery rate.

Study: 48I134H Evaluation of sand bluestem, *Andropogon hallii*

Objective: To evaluate assemblies of sand bluestem, *Andropogon hallii*, for range seeding, erosion control, wildlife food and cover, critical area stabilization, recreation, beautification, or other conservation purposes as determined.

NOTICE OF RELEASE OF COTTLE COUNTY GERMPLASM SAND BLUESTEM  
SELECTED CLASS OF NATURAL GERMPLASM

The U.S. Department of Agriculture, Natural Resources Conservation Service, Knox City Plant Materials Center announces the release of a selected ecotype of sand bluestem, *Andropogon hallii* Hack.

As a selected release this plant will be referred to as Cottle County Germplasm sand bluestem. It has been assigned the NRCS accession number 9031498. Cottle County Germplasm is released as a selected class of certified seed.

This alternative release procedure is justified because there are presently no commercial varieties of sand bluestem adapted for use in west and north central Texas, primarily on the southern Great Plains and Rolling Plains.

**Collection Site Information:** Cottle County Germplasm was originally collected in 1982 from native plants located along US Highway 62/70 in western Cottle County approximately 14 miles west of Paducah, TX (N. Lat. 34°, W Long 100° 30'). Elevation at the collection site is approximately 1900 feet; the soil at the collection site is classified as a Miles fine sandy loam, 5 to 12 percent slope. Average precipitation for the area is around 24 inches. Other plants growing in association included sand dropseed, little bluestem, switchgrass and yellow Indiangrass. The collection site is located in MLRA 78B - Rolling Plains, Western Part.

**Description:** Cottle County Germplasm sand bluestem, *Andropogon hallii*, a native, perennial, warm-season, long-lived bunchgrass. Sand bluestem is widely distributed throughout the western US from North Dakota over to eastern Montana and south to Texas. Cottle County Germplasm resembles big bluestem but has creeping rhizomes. Leaf blades are long, flat and strongly ribbed. Leaf sheath overlap and are keeled at the base, stems are flat at the base and will have a pale purplish color during early growth. The seed head is a pared raceme with a distinctive ring of hair at the base. Sand bluestem has a deep fibrous root system. Cottle County Germplasm like other native bluestems takes two years to establish and produce seed. Sand bluestem will occur with big bluestem on tighter soils but sand bluestem is usually the predominate species on sandier soils especially deep sand sites.

**Method of Breeding and/or Selection:** Cottle County Germplasm was initially evaluation against 43 other accessions from 1983-85. In 1986, 6 selections were identified and placed under advanced evaluation. In 1991 Cottle County Germplasm was selected as the top accession based on survivability, vigor and overall plant performance. Cottle County Germplasm met the selection criteria of finding a southern later maturing ecotype for the southern Great Plains and Rolling Plains. In 1991 Cottle County Germplasm was placed in a forage clipping study along with two other varieties of sand bluestem (Elida and Woodward). Clipping studies show Cottle County Germplasm to have similar crude protein, ADF and NDF levels as the other released varieties. See attachment 1(pages 4-5) for, Initial Evaluation Summary, Summary of Forage Quality Clipping Study, and Seed Yields.

**Environmental Impact Assessment:** Cottle County Germplasm sand bluestem is a selection of naturally occurring germplasm and has been unaltered from its original collection. Cottle County Germplasm did not meet the assessment of a plant that would become invasive based on literature review and the attached "Invasive Species Worksheet" (see attachment 2, pages 6-13).

**Conservation Use:** Cottle County Germplasm may be used in pure stands for pasture and hay plantings or as a component in seed mixtures for range seeding. Its forage value is fair to good while young and tender. After heads mature, forage is fair for cattle and horses. As with all native range grasses it 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. Cottle County Germplasm maybe utilized for filterstrips, field borders, contour buffer strips, and erosion control plantings on sandy soils.

**Anticipated Area of Adaptation:** Cottle County Germplasm sand bluestem is adapted in MLRAs 78A,B,C,D, 77A,B,C,D, 80A,B, 81A,B, and 42 in Texas and Oklahoma. This perennial grass is widely distributed and grows well on sandy textured soils. Cottle County Germplasm is not adapted to saline and wet bottomlands.

**Availability of Plant Materials:** Generation 0 seed (equivalent to Breeder seed) will be maintained by the USDA-NRCS Plant Materials Center at Knox City, Texas. Field production seed is available through the Texas Foundation Seed Service to interested parties for increase purposes.

**References:**

Gould, F. W., The Grasses of Texas. TAMU Press, College Station 1975.

USDA-SCS, 1971, 100 Native Forage Grasses in 11 Southern States, Ag Handbook No. 139.

**Prepared by:**

USDA-NRCS, Plant Materials Center, 3776 FM 1292, Knox City, TX 79529, 940-658-3922.

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Study: 48I136K Evaluation of little walnut, *Juglans microcarpa*

Objective: To evaluate assemblies of little walnut, *Juglans microcarpa*, for windbreaks and shelterbelts, wildlife food and cover, beautification, or other conservation purposes as determined.

Supplement #1 - Two accessions of little walnut (9013188 from Oklahoma and 9013187 from Kansas) were established on the PMC in 1970, and would provide a base for evaluation activities. In 1980 and 1981 collections were made and 12 additional accessions were placed into the evaluation. All accessions were started from seed in nursery plots, grown for one year and transplanted as bare-root stock into three field trial sites. Sites were established in 1983-84 at Knox City PMC (Southern Rolling Plains), Pampa, TX (Southern High Plains - heavy soils), and Levelland, TX (Southern High Plains - sandy soils).

Supplement #2 - After 10 years of evaluation three selections PI-477964 (9013187), Hays, Kansas; PI-477966 (9013188), Carter, OK; and 9028147 Nolan, Co., TX have been selected and will be further evaluated as potential releases.

Supplement #3 - PI-477964 from Hays, KS seems to be the top candidate for release. Seed collected and produced at the Texas Forest Service Nursery, Lubbock, TX has proven to have excellent germination and good seedling vigor.

15 Years Total Growth at Three Locations

	Levelland	Pampa	KnoxCity
9013187	137*	106	265
9013188	149	92	270
9028147	134	72	262
9022822	117	53	209
9029494	139	63	246
9028148	173	82	273
9028146	167	52	264

\*Measurements in inches

Summary: Since 1992 the Hays, Kansas selection was being collected and produced at the TFS Nursery and continues to be superior in its ability to germinate. The PMC has produced approximately 1200 lbs. of seed over the last six years. In 2003 work continued reviewing the release of 477964 as an improved cultivar. There is still interest in using selection 9028147 from Nolan, Co., TX as a possible selection for the Rolling Plains.

Study: 48I140H Evaluation of Little Bluestem (Oklahoma Selection)

Objective: To develop a variety of little bluestem that is superior to current types under evaluation or commercially available selections.

NOTICE OF RELEASE OF OK SELECT GERMPLASM LITTLE BLUESTEM  
SELECTED CLASS OF NATURAL GERMPLASM

The U.S. Department of Agriculture, Natural Resources Conservation Service, Knox City Plant Materials Center announces the release of a selected ecotype of little bluestem, *Schizachyrium scoparium* (Michx.) Nash.

As a selected release this plant will be referred to as OK Select Germplasm little bluestem. It has been assigned the NRCS accession number 9029926. OK Select Germplasm is released as a selected class of certified seed (genetically manipulated track).

This alternative release procedure is justified because there are presently limited commercial varieties of little bluestem adapted for use in southern Oklahoma and central and north central Texas.

**Collection Site Information:** OK Select Germplasm little bluestem was originally collected in 1967 from native stands in Caddo, Grady, Jefferson, Stephens and Washita counties of southwestern Oklahoma.

**Description:** OK Select Germplasm little bluestem, *Schizachyrium scoparium*, is a native, perennial, warm-season, long-lived bunchgrass. Little bluestem is widely distributed throughout the US except Washington, Oregon and California. Culms are 1 to 4 feet tall, erect and large tufted, having occasional short rhizomes. Basal stems and sheaths are flattened. Leaf blades are hairless, V shaped in cross section, keeled, light bluegreen when young, turning reddish brown at maturity. Ligule 1/16 inch in length, membranous, with fringed margins. Inflorescence consists of several unbranched racemes, one on the end of each seed stalk. Spikelets are paired along raceme axis; fertile one plump, awned and stalkless; sterile one stalked, awnless or awn tipped. Little bluestem has a deep fibrous root system, and may be semi-sod forming in subhumid zones.

**Method of Breeding and/or Selection:** OK Select Germplasm was developed from seed collected from a polycross nursery established from the 5 original collections. OK Select Germplasm's parental lines were selected for their seedling and plant vigor, leafiness and quick establishment allowing them to crowd out weeds. Average seed yield/acre for OK Select is around 150 pounds per acre. OK Select Germplasm like other little bluestems takes two years to establish and produce seed. Clipping studies show OK Select Germplasm to have higher seasonal crude protein levels when compared to Cimarron (see attachment 1). Generation studies established to check uniformity through the G2 generation were within acceptable levels with no changes in seed production

**Environmental Impact Assessment:** OK Select Germplasm little bluestem was developed through the natural crossing of five parent lines. OK Select Germplasm did not meet the assessment of a plant that would become invasive based on literature review and the attached "Invasive Species Worksheet" (see attachment 2).

**Conservation Use:** OK Select Germplasm may be used in pure stands for pasture and hay plantings or as a component in seed mixtures for range seeding. Its forage value is fair to good while young and tender. After heads mature, forage is fair for cattle and horses. As with all native range grasses it 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. OK Select Germplasm may be utilized for filterstrips, field borders, contour buffer strips, in riparian forest buffers for nitrogen and phosphorus uptake, and for erosion control plantings.

**Anticipated Area of Adaptation:** OK Select Germplasm little bluestem is adapted in MLRAs 78A, B, C, D, 77A, B, C, D, 80A, B, 84B, C, 85, 86A, B, 87A, B, 81A, B, C, and 82 in Texas and Oklahoma. This perennial grass is widely distributed and grows well on deep, shallow, sandy, fine-textured, rocky soil, except for saline and wet bottomlands. OK Select Germplasm little bluestem maybe used in prairies, open woods, dry hills and fields in Texas and Oklahoma.

**Availability of Plant Materials:** Generation 0 seed (equivalent to Breeder seed) will be maintained by the USDA-NRCS Plant Materials Center at Knox City, Texas. Field production (G1) seed is available through the Texas Foundation Seed Service to interested parties for increase purposes.

**References:**

Gould, F. W., The Grasses of Texas. TAMU Press, College Station 1975.

USDA-SCS, 1971, 100 Native Forage Grasses in 11 Southern States, Ag Handbook No. 139.

Everett, Wayne, USDA-SCS Plant Guide, 9029226 Little Bluestem, 1993

**Prepared by:**

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Study: 48I156H Evaluation of *Calamovilfa gigantea*, giant sandreed

Objective: Evaluate an assembly of giant sandreed and select a superior plant to primarily aid in vegetative sand stabilization needs. Secondary use is revegetation of critically eroding areas.

Supplement #1 – From the initial evaluation study, the top five accessions were selected and combined because of their similarity. The accession number of 9065015 was assigned to the assembly . The new composite is in initial seed increase.

35710-Dickens Co., TX  
35879-Childress Co., TX  
35810-Wilbarger Co., TX  
42928-Childress Co., TX  
42911-Winkler Co., TX

Summary:

To continue with seed harvest and increase until a substantial amount are in storage for future plantings and release.

Study: 48I171K Evaluation of *Lonicera albiflora*, white honeysuckle

Objective: To evaluate an assembly of white honeysuckle as a windbreak, shelterbelt and wildlife plant for Central and West Texas. Should one or more accessions prove superior, these selections will be evaluated in FEP testing.

Project Plan – In the spring of 1986 a collection of White honeysuckle were planted and in 1988 notes were taken and project was discontinued and replaced with another collection of White honeysuckle. In the spring of 1992, of the 32 accessions planted only eighteen accessions germinated for transplanting in the IEP. In the summer of 1993 for the first evaluation, only 9 accessions survived. Following are results of 1994 to 2000 evaluations.

Accn Number	Stand	Drought Tolerance	Winter Recovery
64871-Taylor Co., TX	2	1	1.5
49576-Brown Co., TX	2	1	1.5
64869-Burnet Co., TX	5	1	1.5
9008239-Schleicher Co., TX	5	1	2
64868-Lampasas Co., TX	7	1	3
49511-Sutton Co., TX	7	1	3
64872-Taylor Co., TX	1	1	1.5
49601*-Nolan Co., TX	8	9	7.5
64885*-Lampasas Co., TX	8	9	8
SUM	45.00	25.00	29.50
MEAN	5.0000	2.7778	3.2778

Rating: (1-Best and 9-Worst); \*Plants not alive

Summary:

Will continue to evaluate the remaining accessions and may composite accessions for a select release.

**Introduction**

The original agreement with Big Bend National Park and the James E. 'Bud' Smith Plant Materials Center (PMC) was developed and signed in 1989. Early agreements involve seed and/or plant collection at the Park and seed increase at the PMC. Materials produced were used for roadside revegetation within the park. Plant materials (seeds) were drilled and/or broadcast along road shoulders following construction. The first agreement was completed in 1993. The second agreement scheduled for completion in 1997 was modified to incorporate an additional study to look at techniques for road slope revegetation. In 1998 an additional agreement was put into place to provide materials for the next phase of road construction. This agreement originally scheduled from 1998 - 2001 was amended in 1999 and placed on hold through 2001, pending the rescheduling of construction activities. Currently there are no active agreements targeting roadside revegetation projects.

In 2001 a new agreement was prepared between the Park and PMC addressing the need to revegetate areas after removal of invasive plants. Several new plant species will be looked at to determine if seed production fields can be developed.

**Accomplishments:**

Since 1989 nine different species have been produced for the park and three species are being looked at to determine production and propagation techniques.

At the end of 2003, the park had received a total of 2380 bulk pounds of seed totaling 983 PLS lbs.

**Seed Production and Available Inventory**

Common Name	Area(ac)	2003 Prod./Lbs *	PLS Inventory On Hand
Alkali sacaton	-	-	340.0
Sideoats grama	-	-	186.0
Green sprangletop	-	-	395.7
Cane bluestem	-	-	34.0
Showy menodora	.50	19.50	238.00
Whiplash pappusgrass	increase	.30	.30
Chino grama	.75	12.00	26.7
Tobosa	.10	increase	-
Limoncillo	-	-	29.0 *

\* bulk material wt.

**Conclusion:**

At the end of FY 2003 seed production fields being maintained and harvested included showy menodora, and Chino grama. The center will continue to work with and develop *Hilaria mutica*, tobosagrass, *Scleropogon brevifolius*, burrograss, and *Pappophorum vaginatum*, whiplash pappusgrass seed production. The burrograss failed to establish and the whiplash pappusgrass produced sufficient seed for future increase. The new agreement signed in 2001 addressing post weed control revegetation will continue through 2004.

## Introduction

The agreement between the Chickasaw National Recreation Area from Sulphur, Oklahoma and the James E. 'Bud' Smith Plant Materials Center from Knox City, Texas was developed and signed in 1990. The first through the fifth phase for re-vegetating of the Buckhorn Area, the Guy Sandy Area, the Veterans Lake Area, the Point Campground Rehab and the Point/Perimeter Roads were completed before and/or by 2003. The sixth Phase of the project, which was tree transplants for the Tree Park Wide Area completed by 2003. Phase one through two included native grass seed and woody productions. Phase three through five included seed production of native forb, legume, grass and several shrub/woody transplants. Phase six included several different native woody species for tree transplants for the Tree Park Wide Area. All native plant seeds and woody material were collected from the Park and increased and/or propagated at the Plant Materials Center in Knox City, Texas and delivered to the Park.

## Accomplishments

From 1993 to 2003 the Park received a total of 1,383.43 bulk pounds of native forb and grass seed totaling 854.26 PLS lbs. and 6,628 shrub and woody transplants. They consisted of American & winged elm, black willow, blackjack oak, coralberry, carolina buckthorn, buttonbush, bur oak, chinkapin oak, Chickasaw plum, cottonwood, eastern redbud, green ash, hackberry, post oak, red oak, roughleaf dogwood, sycamore, smooth & winged sumac, persimmon, mexican plum, skunkbush sumac, virginia creeper, and white honeysuckle.

### Seed and Plant Production Inventory Jan. - Dec. 2003

Common Names	Units	2003 Production	Total PLS and # of Plants-On Hand
sideoats grama	.33 ac.	39.00*	92.23 PLS
hairy grama	.25 ac.	7.75*	2.19 PLS
big bluestem	.25 ac.	6.50*	18.89 PLS
little bluestem	.15 ac.	29.50*	36.76 PLS
Indiangrass	.75 ac.	0*	164.88 PLS
purpletop	.23 ac.	28.75*	13.78PLS
wildrye sp.	.09 ac.	1.50*	20.24PLS
buffalograss	200 sq. ft.	.25*	1*
eastern redbud	ea.	0	177
red oak	ea.	0	26
cottonwood	ea.	0	0
sycamore	ea.	0	7
purple coneflower	.03 ac.	.15*	1.80*
Mexican hat	.03 ac.	.10*	3.70*
Indian blanket	.03 ac.	.25*	1.70*
purple prairie clover	.03 ac.	.15*	.15*
black-eyed Susan	.03 ac.	.35*	11.05*
clasping-leaved coneflower	.03 ac.	.10*	.10*

gayfeather	.03 ac	.45*	12.75*
American elm	ea.	0	9
Green ash	ea.	0	173
chinkapin x bur oak	ea.	0	20
winged elm	ea.	0	51
hackberry	ea.	0	19

Bulk lbs.\*

Study: 48I187J Evaluation of *Abutilon fruticosum*, sweet indianmallow

Objective: To evaluate an assembly of sweet indianmallow and select a superior plant to primarily enhance water quality, for improvement of range and pastureland and to promote food and cover for wildlife.

Initial Evaluations between 1992 – 2000.

Accn #	Emergance	Survival	Vigor	Stand	EarlyBlooms	FreezeRecv.	DroughtToler.
49534 Williamson Co.	6	1.5	5.8	3	5	5	1
49539 Caldwell Co.	4	2	5.3	2	5	4	1
49542 Guadalupe Co.	8	2.5	6	5	6	5	1
49544-Bell Co.	5	4.5	5.5	7	6	5	1
49553-Bell Co.	7	3	5.3	5	5	5	1
49559-Palo Pinto Co.	3	2	5.5	4	5	5	1
49560-Parker Co.	2	2.5	5.5	3	5	5	1
49561-Williamson Co.	5	2	4.8	2	5	4	1
49564-Burnet Co.	6	2.5	6.3	5	6	5	1
49567-McLennan Co.	7	7.5	6.8	8	5	7	1
49578-Schleicher Co.	5	2.5	4.5	2	5	4	1
49589-Real Co.	5	2	5.5	3	5	6	1
49590-Coryell Co.	6	2.5	6	7	5	5	1
49599-Lampasas Co.	8	1.5	5.8	5	4	5	1
49609-Callahan Co.	6	2.5	6	6	5	5	1
49618-Llano Co.	8	1	7	9	9	9	1
49621-Menard Co.	8	1.5	6	8	6	6	1
49623-Concho Co.	8	3	5.8	6	5	5	1
49630-Williamson Co.	7	2.5	5.5	1	5	2	1
49631-Caldwell Co.	8	2.5	4.3	3	6	4	1
64849-Lampasas Co.	9	9	9	9	9	9	9
64850-Lampasas Co.	8	3.5	6.3	5	5	5	1
64853-Bell Co.	6	2	6	3	5	5	1
64856-Burnet Co.	8	5	6.3	8	6	6	1
64857-Burnet Co.	6	4	6.3	4	4	5	1
64858-Burnet Co.	8	1.5	5.8	8	6	5	1
64859-Coleman Co.	2	1.5	5.5	4	5	4	1
64862-Refugio Co.	7	5	4.8	7	6	5	1
64870-Bell Co.	3	1	5.3	4	4	4	1
64878-Coryell Co.	5	2.5	6	4	4	5	1
64883-Gonzales Co.	7	1	5	3	6	5	1
64889-Guadalupe Co.	8	2	6.3	6	6	6	1
64891-Brown Co.	4	2.5	5.8	6	5	6	1
64893-Schleicher Co.	6	2.5	5.5	3	4	4	1
SUM	209	94.5	197.1	168	183	175	42
MEAN	6	2.5	5.8	5	5	5	1

Ratings (1-Best and 9-Worst)

Summary:

In 2000, collect seeds from all accessions remaining from initial plots and plots removed. Seed is being combined and planned for further evaluation.

Study: 48I188S Evaluation of *Calylophus serrulatus*, halfshrub sundrop

Objective: To evaluate an assembly of halfshrub sundrop and select a superior plant to primarily enhance water quality, improvement of range and pastureland and to promote food and cover for wildlife. Secondary uses are ground cover vegetation for critically eroding areas to reduce soil loss and improve water quality.

Project Plan: In May 17, 1993 transplanted 35 accessions for Initial Evaluation. In the seven years of growing, observation and three years of evaluation these are the accessions that survived through drought and limited rainfall.

Accession	Drought	Vigor	% Stand	Early Bloom	Freeze Recovery
64934-Bell Co., TX	1	8.5	9	9	9
64916-Comanche Co., TX	1	6.5	5	6	6
64958-Childress Co., TX	1	6	8	3	3
64865-Lipscomb Co., TX	1	6	5	5	5
49629-King Co., TX	1	3	4	4	4
64959-Montague Co., TX	1	6	4	5	5
64863-Lipscomb Co., TX	1	4.5	5	2	3
64932-Mc Lennan Co., TX	1	5.5	3	5	4
SUM	8	46	43	39	39
MEAN	1	6	5	5	4.5

Rating (Best-1 and Worst-9)

Summary: The plots were removed in 2000. Due to the foreseen problems associated with seed production and harvest the species will probably not be released. A Plant Fact Sheet for the species will be developed.

Study: 48I190S Evaluation of *Panicum havardii*, Havard panicum

Objective: To evaluate an assembly of Havard panicum and select a superior plant to primarily aid in cultural techniques for saline and/or alkaline soil conditions and for stabilizing sandy soils that have high erosion potential.

Project Plan: In the fall of 1998, seeds from the 11 accessions in the IEP were collected, combined and given a new accession number of 9065020. In May of 1999 the composite was planted for initial seed increase. Following are results for the individual accessions following five years of observation.

Accession	Stand	Early-Stage of Bloom	Vigor	Freeze Recovery
9049593Crane Co., TX	2	6.5	5.5	4
9049592-Crane Co., TX	7	5.5	5	4
9003951-Winkler Co., TX	8	4	4.5	4
9049287-Andrews Co., TX	2	5	7	4
9064960-Crane Co., TX	7	5	5.5	4
9001480-Old Composite	4	4	4.5	4
9064950-Andrews Co., TX	3	5	5.5	4
9004621-Andrews Co., TX	4	4	6.5	4
9049541-Crane Co., TX	3	4	5	4
9064880-Ward Co., TX	6	5	5.5	4
9064890-Crane Co., TX	7	6	5.5	4
SUM	53	54	60	44
MEAN	4	5	5.5	4

Rating (1-Best and 9-Worst)

Summary: Havard panicum is in initial seed production.

Study: 48I192S Evaluation of *Acacia angustissima*, prairie acacia

Objective: To evaluate an assembly of prairie acacia and select a superior plant for improvement of range, promote food and cover for wildlife and provide ground cover vegetation for critically eroding areas to reduce soil erosion and improve water quality.

Project Plan: In May of 1997 transplanted 17 accessions into initial evaluation planting. Following are results from the past five years of evaluations.

Accession Number	Drought	Seed Prod	Vigor
9049624– Frio Co., TX	1	6	1
9064978 – King Co., TX	1	6	1
9049620– Runnels Co., TX	1	6	1
9049617– Crockett Co., TX	1	1	1
9064926 – Austin Co., TX	1	1	1
9064928– Lee Co., TX	1	4	1
9064965– Haskell Co., TX	1	1	1
9064952– DeWitt Co., TX	1	3	1
9064922– Coke Co., TX	1	1	1
9064970– Callahan Co., TX	1	1	1
9064972 – Bell Co., TX	1	1	1
9064924– Grimes Co., TX	1	1	1
9064921– Taylor Co., TX	1	1	1
9064915– Hamilton Co., TX	1	1	1
9049622– Schleicher Co., TX	1	6	1
9064933– Bell Co., TX	1	2	1
9064917– Comanche Co., TX	1	1	1
SUM	17	43	17
MEAN	1	2.52941	1

Rating: (Best-1 and Worst-9)

Summary:

Plans are to continue to evaluate, observe and collect seeds from all accessions of prairie acacia. In 2003 the composite assembly was established for an initial seed increase.

Study: 48I193S: Technical Evaluation of *Spartina pectinata*, prairie\_cordgrass

Objective: To evaluate selected assemblies of prairie cordgrass for use in water quality improvement and for re-vegetation of saline and/or alkaline soil conditions.

Project Plan: In 1997, 3 accessions of prairie cordgrass were planted for comparison.

Accession Number	Drought Tolerance	Seed Potential	Winter Recovery
9064975	2	3	1
9064974	1	1	1
434434	2	2	1

Rating: (1-Best and 9-Worst)

9064975-Lipscomb Co., Tx

9064974-Donley Co., Tx

434434-Hutchinson Co., Tx

Summary:

Will continue to evaluate and collect seeds from the three accessions and composite for seed testing and possible seed increase.

Study: 48I195S Evaluation of *Andropogon glomeratus*, bushy bluestem

Objective: To evaluate selected assemblies of bushy bluestem for use in water quality improvement and for revegetation of saline and/or alkaline areas and riparian corridors.

Project Plan: In May of 1998 ten accessions were transplanted into IEP. As of November 2000, only one accession survived.

Summary:

In 1999 additional collections of bushy bluestem were requested. Few collections have been received. The PM technical committee will need to decide if there is a need to keep the study.

Study: 48I196S Evaluation of *Tridens flavus*, purpletop

Objective: To evaluate selected western assemblies of purpletop for use in water quality improvement, vegetative filter strips and for re-vegetation of critically eroded areas.

Project Plan: In 1998, 13 accessions of purpletop were placed into IEP. As of October 2001, there were only seven accessions surviving. Following is Summarized data rating.

Accn Number	Drought Resistance	Uniform Growth	Disease Resistance	Survivability
9065004-Hood Co., TX	2	7.5	2	9
9064990-Callahan Co., TX	2	7.5	2	9
9064987-Erath Co., TX	2	2	2	2
9064996-Young Co., TX	2	7.5	2	9
9064998-Wichita Co., TX	2	4	2	1.5
9065008-Brown Co., TX	2	5.5	2	2
9065009-Callahan Co., TX	2	7.5	2	5
SUM	14	41.5	14	37.5
MEAN	2.00	5.93	2.00	5.36

(1-Best and 9-Worst).

Summary:

Additional collections were received in 2003 and a new IEP will be established in 2004.

Study: 48I199S Evaluation of waterwillow

Objective: To evaluate collections of waterwillow for riparian revegetation and water quality

Summary: In year 2002 this project was still on hold. Plans to collect and evaluate this species are pending funding to support the needed personnel and construction of a site to hold plants. Future plans may involve using the Center's constructed wetland septic system as a site for evaluation.

Study: 48I200S Evaluation of sawgrass

Objective: To evaluate collections of sawgrass for riparian revegetation and water quality

Summary: In year 2002 this project was still on hold. Plans to collect and evaluate this species are pending funding to support the needed personnel and construction of a site to hold plants. Future plans may involve using the Center's constructed wetland septic system as a site for evaluation.

Study: 48I201S Evaluation of alkali bulrush

Objective: To evaluate collections of alkali bulrush for riparian revegetation and water quality

Summary: In year 2002 this project was still on hold. Plans to collect and evaluate this species are pending funding to support the needed personnel and construction of a site to hold plants. Future plans may involve using the Center's constructed wetland septic system as a site for evaluation.

Study: 48I202J Nutritional Evaluation of Perennial Species for White-tailed Deer Food Plots

Objective: 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 this study will be used to make additional recommendations on the establishment and usage of perennial plants used in deer food plots and as a basis for future cultivar development and enhancement.

Sites established included:

- TPWD - Kerr Wildlife Management 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 bush sunflower
- 'Sabine' Illinois bundleflower
- 'Yellow Puff' littleleaf leadtree
- 'Comanche' partridge pea
- 'Aztec' Maximilian sunflower

Summary: In year 2003 the site at Kerr WMA is established and giving some data. All sites have had trouble with establishment due to drought conditions the past four years. Due to limited seed supplies at the PMC a decision will be made on whether to continue this study.



Study: 48I203J Native Plants for Wildlife in Urban Settings

Objective: Plants are needed for urban landscapes that are drought tolerant and provide food and shelter for urban wildlife. Native plants are adapted to the dryer conditions of west Texas and have been successfully used in landscape plantings. The commercial market offers a wide range of plant species that are targeted for urban wildlife but many are not native and/or not adapted to dryer areas of western Texas. The Plant Materials Center has released several forbs, legumes and woody shrubs that are adapted for use in urban plantings. This study will look at native plants that are adapted to western Texas and develop a plant species list for landscape use.

If funds and time are available the PMC will cooperate with interested groups to develop demonstration site, showing the actual use of native plants in landscape plantings

Supplement #1 Established demo buffalograss lawn at Knox City Community Center

Summary: In year 2000 work continued looking at possible species for use in the landscape plantings throughout the Rolling Plains. In 2002 the study will compile and develop a list of plants adapted for landscape use with emphasis on the Rolling Plains area of Texas. In 2003 the center cooperating with the Knox County Extension Horticultural Committee presented two programs dealing with native plants and low input maintainance.