United States Department of Agriculture
Natural Resources Conservation Service

2009 ANNUAL TECHNICAL REPORT

JAMES E. "BUD" SMITH PLANT MATERIALS CENTER

Serving Texas, southwestern Oklahoma, eastern New Mexico, southeastern Colorado, and southwestern Kansas

UNITED STATES DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

JAMES E. "BUD" SMITH PLANT MATERIALS CENTER

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HISTORY

The Natural Resources Conservation Service/James E. "Bud" Smith Plant Materials Center had its beginning in 1935 in San Antonio, Texas. The San Antonio Nursery was established under the Soil Erosion Service. It later became the Soil Conservation Service (SCS), which is known today as the Natural Resource Conservation Service (NRCS). In the late 50's and early 60's there were two Plant Materials Centers operating through a cooperative enterprise between the Texas Agriculture Experiment Station and the Soil Conservation Service. The Spur, Texas Plant Materials Center was the primary center with the San Antonio Plant Material Center being a sub-center. The Spur Plant Materials Center was located on 48 acres of irrigated land and the San Antonio Sub-Center was located on 30 acres of irrigated land. Seed production from both of the centers was processed at the Big Spring Field Station. It appears that both Plant Materials centers were closed in 1964 and all material moved to Knox City in 1965 when the Knox City Plant Materials Center was establish. Since 1965 all of the seed production has been processed at Knox City.
On September 7, 1967, the Knox City Plant Materials Center (PMC) was given the honorary name of James E. "Bud" Smith Plant Materials Center in honor of Bud's dedicated service in early plant science work from 1935 up until 1965. The PMC original long-term lease from Mr. T. R. Campbell was for 60 acres of irrigated land. The current lease is for 137.5 acres of his land.

Past Managers at the NRCS/James E. "Bud" Smith PMC	**Dates**
Arnold G. Davis	2/1965 to 6/1966
Howard A. Carleton	11/1968 to 5/1969
Jacob C. Garrison	5/1969 to 7/1974
David G. Lorenz	9/1974 to 3/1984
Jon B. Muncrief	1984 to 8/1985
James S. Alderson	2/1986 to 1/1990
Morris J. Houck	6/1990 to 9/2006
Ray T. Cragar	4/2007 to 7/2008
Gary L. Rea Ph. D	10/2008 to present

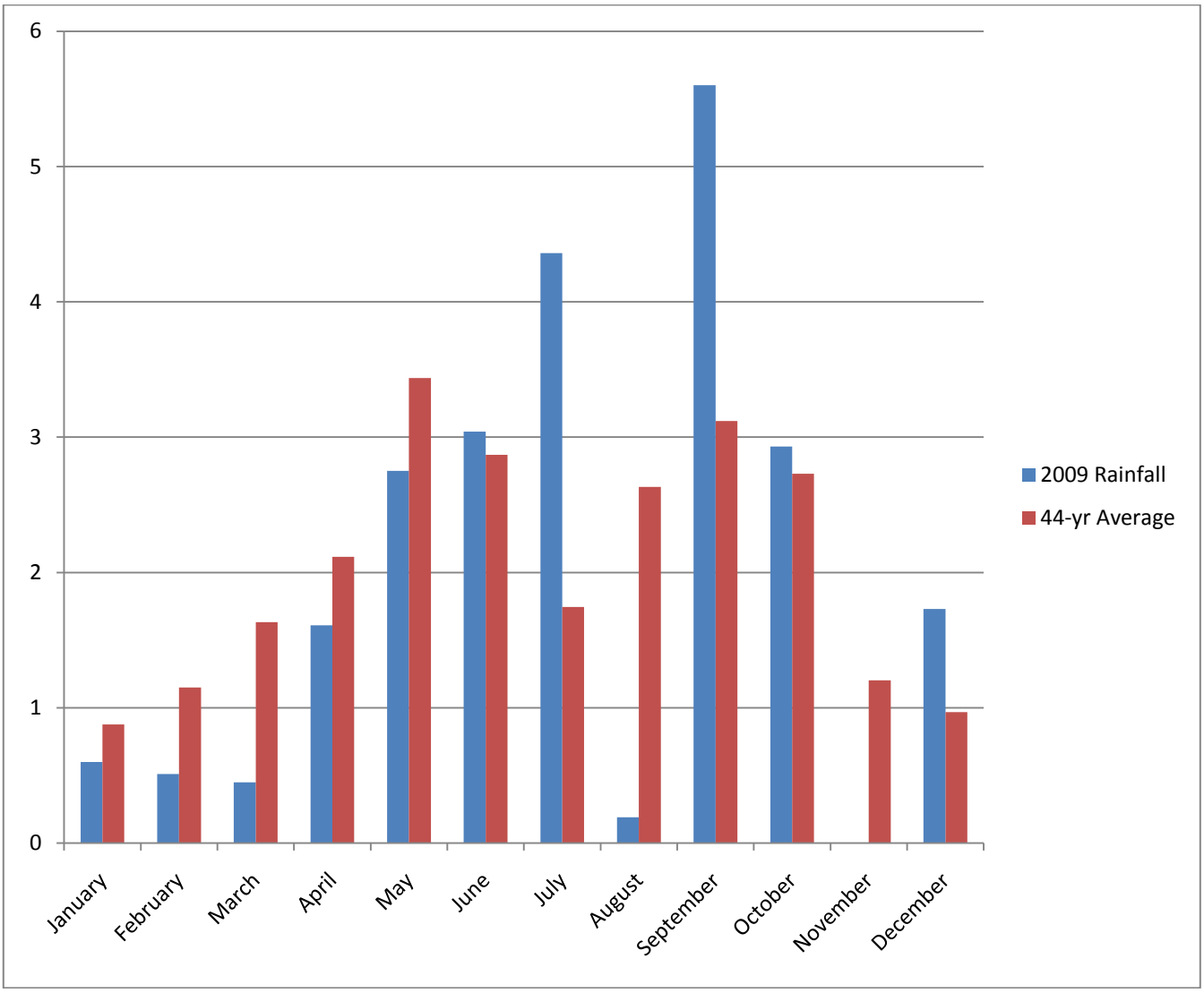
INTRODUCTION

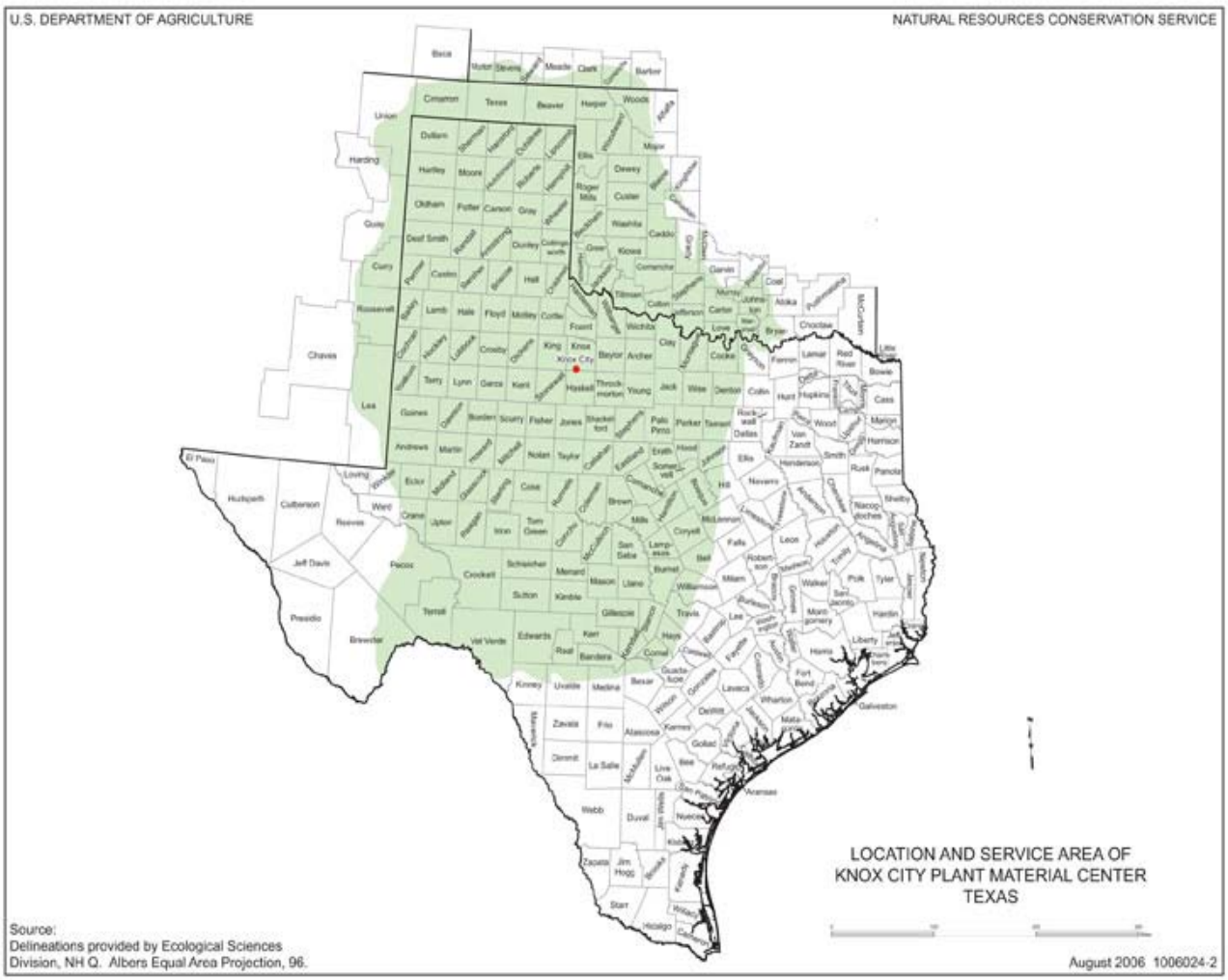
The James E. "Bud" Smith Plant Materials Center is responsible for developing conservation plants and cultural techniques for use on targeted Major Land Resource Area (MLRA) in Texas, Oklahoma, Kansas, Colorado, and New Mexico.

The Plant Materials Center is located approximately 4½ miles NW of Knox City, Texas, in the Rolling Red Plains Land Resource Area. The site is located about 33° north latitude, 100° west longitude and 1500 feet above sea level. Seven shallow irrigation wells supply irrigation water to all fields through an underground pipeline.

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 applied to control wind erosion.

The PMC has a long-term average of 230 frost-free days in its growing season. Rainfall for 2009 was recorded at 24.45 inches, which is right at the 43-year average of 24.45 inches. Precipitation for the Center is mainly received in the form of spring, summer and fall rain showers. Snowfalls during winter where few and contribute minor amounts to total rainfall.





SERVICE AREA

The service area of the NRCS James E. “Bud” Smith Plant Materials Center includes a large portion of Texas, southwestern Oklahoma, and a portion of Kansas, Colorado, and New Mexico. The work here is coordinated with the work done at other Plant Materials Centers in Texas and throughout the United States. The shady portions of the map below indicate the Service area.

JAMES E. “BUD” SMITH PLANT MATERIALS CENTER LONG RANGE PLAN

I. Introduction

The mission of the Plant Materials Program is to develop and deliver 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 plant species, 4.) provide for the development and transfer of state of the art applied science technology.

The PMC Long Range Plan (LRP) is used to identify, guide, and direct PMC operation toward solving high-priority resource problems identified in the State(s) Plant Materials LRP. **The James E. “Bud” Smith PMC is directed by needs identified in the Long Range Plans of Texas, Oklahoma, Kansas, Colorado, and New Mexico. It is consistent with goals and objectives identified in the NRCS Strategic Plan.**

II. Long Range Plan Development

This Long Range Plan (LRP) 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 state of Texas, portions of Oklahoma, Kansas, Colorado, and New Mexico.

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 539.1, 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 5b through 8b 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 12 to 36 inches.

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

67B – Central High Plains, Southern Part
42 – Trans-Pecos
70A – Canadian River Plains and Valleys
70B – Upper Pecos River Valley
77A, B, C, D, E - Southern High Plains
78A, B, C, D - Central Rolling Red Plains
80A - Central Rolling Red Prairies
80B - North Texas Central Prairies
81A, B, C, D - Edwards Plateau
82A, B - Texas Central Basin
83A – Northern Rio Grande Plain
83B – Western Rio Grande Plain
84A - Cross Timbers
84B - West Cross Timbers
84C - East Cross Timbers
85 - Grand Prairie
86A - Northern Texas Blackland Prairies
87B – Texas Claypan Area, Northern Part

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 James E. “Bud” Smith 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
Plains Germplasm prairie acacia

Current plant science studies:
Evaluation of giant sandreed
Evaluation of Plains Germplasm 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:
Currently no studies

NRCS 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 approximately 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
Plains Germplasm prairie acacia

Current plant science studies:
Evaluation of Pains Germplasm prairie acacia
Evaluation of Havard panicum
Evaluation of purpletop

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.
---collect and evaluate of plants from sites.
---evaluating techniques needed to enhance establishment.
---release adapted plants 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 giant sandreed

NRCS 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, Oklahoma, Kansas, Colorado, and New Mexico. All major land resource areas in these states 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' Yellow Indiangrass
'Yellow Puff' littleleaf leadtree
'Saltalk' alkali sacaton
'Haskell' sideoats grama
'Sabine' Illinois bundleflower
'Comanche' partridge pea
'Plateau' awnless bushsunflower
'Van Horn' green sprangletop
'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
Plains Germplasm prairie acacia

Current plant science studies:
Evaluation of sweet Indianmallow
Evaluation of purpletop
Evaluation of Plains Germplasm prairie acacia

NRCS 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
Plains Germplasm prairie acacia

Current plant science studies:
Evaluation of Plains Germplasm prairie acacia
Technical evaluation of purpletop

NRCS Objective: 2.5 High-quality habitats on private land supporting the Nation's wildlife heritage.

A. Species selection and cultural technique development needed to promote food and cover for wildlife.

Problem:
There is a need for commercially available adapted plant materials indigenous to the major land resources in Texas, Oklahoma, Kansas, Colorado and New Mexico.

Objective:
To identify, collect, develop and cooperatively release grasses, forbs, legumes, and woody species adapted to Texas, Oklahoma, Kansas, Colorado and New Mexico for wildlife.

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

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

‘Alamo’ switchgrass
‘Aztec’ Maximilian sunflower
‘Rainbow’ wild plum
‘Yellow Puff’ littleleaf leadtree
‘Sabine’ Illinois bundleflower
Hondo Germplasm velvet bundleflower
Cuero Germplasm purple prairie clover
Kerr Germplasm wright pavonia
‘Boomer’ bur oak
‘Plateau’ awnless bushsunflower
‘Eldorado’ Engelmanndaisy
Plains Germplasm prairie acacia

Current plant science studies:
Evaluation of Plains Germplasm prairie acacia
Technical evaluation of purpletop

TECHNOLOGY TRANSFER

PUBLICATIONS

Training Sessions:

Equipment Identification and Introduction to Plant Collection Procedures and Demonstration. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. July 2009.

Presentations:

Seasonal Growth and Nutritive Quality Distribution for 7 Warm Season Perennial Grasses in the Texas Rolling Red Plains. Oklahoma City, OK. October 2008.

Seasonal Growth and Nutritive Quality Distribution for 7 Warm Season Perennial Grasses in the Texas Rolling Red Plains. Albuquerque, NM. February 2009.

Plants for Various Conservation Use. James E. “Bud” Smith PMC. February 2009.

James E. “Bud” Smith PMC Introduction and Update. June 2009.

PMC Managers Report. August 2009.

Newsletters:

Knox City Knowledge. Summer 2009. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. Volume 1, Issue 1.

Plant Fact Sheets:

Plant Fact Sheet Awnless Bushsunflower. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. July 2009.

Plant Fact Sheet Engelmann’s Daisy. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. July 2009.

Plant Fact Sheet Purple Prairie Clover. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. August 2009.

Plant Fact Sheet Spike Dropseed. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. August 2009.

Plant Fact Sheet Texas Dropseed. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. September 2009.

Plant Fact Sheet Velvet Bundleflower. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. July 2009.

Posters:

Seasonal Growth and Nutritive Quality Distribution for 7 Warm Season Perennial Grasses in the Texas Rolling Red Plains. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. February 2009.

Abstracts:

Seasonal Growth and Nutritive Quality Distribution for 7 Warm Season Perennial Grasses in the Texas Rolling Red Plains. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. February 2009.

Reports:

KCPMC 2008 Annual Tech Report. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. 2009.

2008 Progress Report of Activities. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. 2008.

Technical Notes:

Forage Production. Nutritive quality and Growth Pattern of Various Warm Season Grasses. USDA/NRCS James E. “Bud” Smith PMC, Knox City, TX. June 2009.

STUDIES

The Plant Materials Center staff plan and develop studies to solve problems identified in the PMC's Long-Range Plan. All active studies are listed below with the study number and name and their objectives. Each study is identified in the following pages.

Study Number and Name: 48A156H Evaluation of giant sandreed

Study Objective: Evaluation and release of selected accessions of big sandreed.

Study Number and Name: 48I187J Evaluation of sweet Indianmallow

Study Objective: Evaluate and release selected accessions of sweet Indianmallow.

Study Number and Name: 48I190S Evaluation of Havard panicum

Study Objective: Evaluation and release of selected accessions of Havard panicum.

Study Number and Name: 48I196S Evaluation of purpletop tridens

Study Objective: Evaluate and release accessions of purpletop for wildlife habitat.

Study Number and Name: TXPMC-P-0501-RA North Texas Ecotype Project

Study Objective: Conserve, evaluate and release native plant ecotypes for North Texas.

Study Number and Name: TXPMC-T-0601 Growth Curve Study
Study Objective: Evaluate forage production, nutritive quality and growth pattern of warm season grasses under low and high fertility management.

Study Number and Name: TXPMC-T-0701-BF Biofuel Study
Study Objective: Evaluate timing of harvest on biomass production and fuel quality of switchgrass cultivars, big bluestem, Indiangrass and giant miscanthus.

Study Number and Name: TXPMC-P-0702-PA Observational Planting Blue grama
Study Objective: To determine the potential adaptation and pasture/hayland use and range seeding mix.

Study Number and Name: TXPMC-P-0703-CR Observational Planting Big Sacaton
Study Objective: To determine the area of adaptation and cropland use as windstrips.

Study Number and Name: TXPMC-P-0704-RA ARS. Woodward OK; Sand bluestem Project
Study Objective: Evaluate sand bluestem breeding lines under field conditions bred for improved germination and establishment for southern plains and pasture landscapes.

Study Number and Name: TXPMC-S-0705-OT The Nature Conservancy
Study Objective: Texas Nature Conservancy, in managing its Clymer Meadow preserve, has a need to preserve the native plant resources, to revegetate disturbed lands within said preserve and to avail seedstock to other landholders connected to the preserve by proximity or hydrology.

Study Number and Name: TXPMC-P-0706-RA Observational Planting Lavaca Germplasm Canada wildrye
Study Objective: To determine area of adaptation and rangeland use.

Study Number and Name: TXPMC-P-0803-RA Legume Trial: Dr. J. Muir, TAES – Stephenville, TX
Study Objective: Evaluation of selected lines of native legumes at various sites in Texas under a prescribed management scheme.

Study Number and Name: TXPMC-T-0807-RA ICST-Alkali sacaton
Study Objective: Compare alkali sacaton selections for adaptability.

Study Number and Name: TXPMC-T-0901-ICST-Arizona cottontop
Study Objective: Compare Arizona cottontop selections for adaptability.

Study Number and Name: TXPMC-T-0902-ICST-‘Tropic Sun’ Sunn Hemp
Study Objective: Adaptability of ‘Tropic Sun’ Sunn Hemp.

Study Number and Name: TXPMC-T-0903-BF ICST- Biomass Study
Study Objective: Comparison of Warm Season Perennial Species for Biomass Production.

Study Number and Name: TXPMC-P-0904-RA Evaluation of vine-mesquite
Study Objective: Collection, assembly and evaluation.

Study Number and Name: TXPMC-P-0905-RA Evaluation of Blue Grama
Study Objective: Collection, assembly and evaluation.

Study Number and Name: TXPMC-P-0907-RA Evaluation of Threeflower melic
Study Objective: Collection, assembly and evaluation.

Study Number and Name: TXPMC-P-0908-WL Evaluation of showy menodora
Study Objective: Collection, assembly and evaluation.

Study Number and Name: TXPMC-T-0909-PA ICST-Eastern Gamagrass
Study Objective: Replicated Study of Four Releases of Eastern Gamagrass.

Study No. : 48A156L - Evaluation of *Calamovilfa gigantea*, giant sandreed

Objective: Evaluation of 19 individual plants of giant sandreed accession 9065015 and select a superior plant or plants to primarily aid in vegetative sand stabilization needs or in revegetation of critically eroding areas.

Supplements #2 – From the initial evaluation study, the four accessions were selected. Accession 42911 did not survive in the initial evaluation study (See table 1.1). The four surviving accessions were bulked and given the accession number 9065015. The bulk was increased in 2005. Germination tests were used to screen for cold stress, heat,acid and salinity. The seedlings that survive the screening were transplanted at the James E. "Bud" Smith PMC on 6/4/2007 for further evaluation. See table 1.2 for plot layout below.

Table 1.1 Accessions from the initial evaluation study

Accessions	County	Remarks
35710	Dickens Co., TX	
35879	Childress Co., TX	
35810	Wilbarger Co., TX	
42928	Childress Co., TX	
42911	Winkler Co., TX	Did not survive and not in composite.

Polycross Study Plot Layout
Table 1.2

9065015 Giant sandreedgrass
North End

D	C	D	
C	H	C	A
D	A	H	C
A	D	C	B
B	C	A	C

South End

A=Acid	4	plants
B=Heat	2	plants
C=Cold	7	plants
D=Salt	4	plants
*H=Heat	2	plants
Total	19	plants

Evaluation Factors: Evaluate plants for early greenup, robust, spreading and height.

Progress or Status: Evaluation was done this year for the factors mentioned above. See Tables 1.3, 1.4, 1.5, and 1.6 below for results.

Table 1.3 Evaluation for early greenup. The ability of a plant to greenup early, before the last frost and survive.

9065015 Giant sandreedgrass AEP Evaluation **(Early Greenup)** 3/24/2009
North End

D **5**	C **3**	D **4**	
C **7**	H **3**	C **3**	A **3**

D **5**	A **1**	H **0**	C **1**
A **7**	D **3**	C **1**	B **6**
B **7**	C **0**	A **0**	C **4**

South End

A=Acid	4	plants
B=Heat	2	plants
C=Cold	7	plants
D=Salt	4	plants
*H=Heat	2	plants
Total	19	plants

Table 1.4 Evaluation for robust. Robust is the strength, vitality and energy of the plant to grow on a specific site.

9065015 Giant sandreedgrass (AEP) Evaluation **(Robust)** 9/29/2009

North End

D **7**	C **7**	D **1**	
C **6**	H **4**	C **7**	A **3**
D **5**	A **1**	H **0**	C **3**
A **8**	D **4**	C **2**	B **6**
B **7**	C **0**	A **0**	C **7**

South End

A =Acid	4	plants
B=Heat	2	plants
C=Cold	7	plants
D=Salt	4	plants
*H=Heat	2	plants
Total	19	plants

Table 1.5 Evaluation for spreading. The ability of a plant, which will reproduce vegetatively in amount and distance from the original plant.

9065015 Giant sandreedgrass (AEP) Evaluation **(Spreading)** 9/29/2009

North End

D **5**	C **7**	D **1**	
C **3**	H **3**	C **7**	A **3**
D **3**	A **1**	H **0**	C **3**
A **7**	D **5**	C **1**	B **7**
B **7**	C **0**	A **0**	C **7**

South End

A = Acid	4	plants
B = Heat	2	plants
C = Cold	7	plants
D = Salt	4	plants
*H = Heat	2	plants
Total	19	plants

Table 1.6 Evaluation for height. Plant height measurements were taken at maturity stage.

9065015 Giant sandreedgrass (AEP) Evaluation **(Height)** 9/29/2009

North End

D **68"**	C **50"**	D **66"**	
C **90"**	H **62"**	C **50"**	A **56"**
D **36"**	A **73"**	H **0**	C **66"**
A **42"**	D **68"**	C **80"**	B **54"**
B **45"**	C **0**	A **0**	C **32"**

South End

A = Acid	4	plants
B = Heat	2	plants
C = Cold	7	plants
D = Salt	4	plants
*H = Heat	2	plants
Total	19	plants

Study No. : 48I187J - Evaluation of *Abutilon fruticosum*, sweet Indianmallow

Objective: 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.

Evaluation Factors: Evaluate plants for emergence, survival, vigor, stand, early bloom, freeze recovery and drought tolerance.

Progress or Status: Thirteen accessions survived in the greenhouse and were transplanted in June of 2009. Seed was harvested in the fall in order to increase availability for future needs. Observations showed that accessions could be selected based on flower color, timing of flowering, and seed production. The accessions selected for this study are 9064878, 9049589, 9064853, 9064883, 9049560, 9049539, 9049559, 9064859, 9049534, 9049631, 9064870, 9064893, 9049578, 9049561, and 9049630. Accessions were set up in a randomized complete block.

Rep 3	GR	11	8	6	13	7	9	3	5	12	1	10	4	2	GR	Rep 3
Rep 2	GR	9	7	10	1	12	2	13	11	4	3	5	8	6	GR	Rep 2
Rep 1	GR	1	2	3	4	5	6	7	8	9	10	11	12	13	GR	Rep 1
Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Row

Entry	Accession	County (TX)
1	9049561	Williamson
2	9049578	Schleicher
3	9049534	Williamson
4	9049630	Williamson
5	9049631	Caldwell
6	9064870	Bell
7	9064878	Coryell
8	9049589	Real
9	9064853	Bell
10	9064883	Gonzales
11	9049560	Parker
12	9049539	Caldwell
13	9064859	Coleman

Remarks: Transplanted on 6/3/2009 in B-1 Block

Study No. : 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.

Evaluation Factors: Evaluate for stand, early-stage of bloom, vigor, and freeze recovery.

Progress or Status: No evaluations were conducted this year. Selected plants were transplanted in the spring and seed was collected in the fall to be started in the greenhouse. This is a composite of 11 accessions that was given the accession #9065020. The original increase of these accessions was contaminated with switchgrass. Table 3.1 shows the results for the individual accessions during the two years of evaluation and five years of observation.

Table 3.1

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)

Study No. : 48I196S - Evaluation of *Tridens flavus,* purpletop

Objective: Evaluate for use in water quality improvement, vegetative filter strips and re-vegetation of critically eroded areas. Purpletop is frequently found in open woods and on roadsides in Pineywoods and Post Oak Savannahs in Texas. It grows in other parts of Texas, such as in the Gulf Prairies and Marshes, Blackland Prairies, Cross Timbers and Prairies, Edwards Plateau, Rolling and High Plains, but not as frequent.

Evaluation Factors: The plantings will be evaluated for early greenup, uniform growth, % stand, vigor, and date of maturity.

Progress or Status: Purpletop *Tridens flavus* (L.) Hitchc. Evaluations continuing for different traits. Early greenup usually occurs in March, but evaluations were not made. See table 5.1 for results of 2009 for uniform growth. Percent stand, vigor, and date of maturity evaluations were not taken.

Table 5.1

IEP Purpletop Evaluation

B-1 Block
4/10/2009
Uniform growth

N to S	Rep-1		Rep-2		Rep-3	
Row 1	Guard Row		Guard Row		Guard Row	
Row 2	9085630	**4**	9085639	**7**	9085645	**4**
Row 3	9065036	**3**	9085636	**7**	9065048	**4**
Row 4	9085627	**2**	9085644	**3**	9065046	**4**
Row 5	9085626	**1**	9085638	**5**	9085626	**6**
Row 6	9085656	**7**	9065038	**5**	9085633	**5**
Row 7	9085633	**7**	9065046	**5**	9085630	**3**
Row 8	9085639	**7**	9085645	**5**	9065033	**5**
Row 9	9065048	**4**	9064986	**4**	9065036	**5**
Row 10	9065046	**3**	9085656	**8**	9085656	**5**
Row 11	9065003	**5**	9065048	**9**	9085628	**5**
Row 12	9065047	**5**	9065003	**9**	9085637	**7**
Row 13	9085628	**5**	9085635	**7**	9065038	**3**
Row 14	9085644	**7**	9085626	**5**	9085636	**8**
Row 15	9065032	**3**	9065047	**5**	9064986	**4**
Row 16	9065033	**7**	9085634	**5**	9065039	**5**
Row 17	9065039	**1**	9085637	**5**	9085639	**6**
Row 18	9085638	**5**	9065032	**1**	9085627	**5**
Row 19	9085645	**2**	9065033	**5**	9085644	**8**
Row 20	9085636	**7**	9065036	**3**	9085635	**5**
Row 21	9064986	**5**	9085633	**3**	9065047	**5**
Row 22	9085637	**5**	9085630	**5**	9065003	**5**
Row 23	9085635	**5**	9085628	**4**	9065032	**3**
Row 24	9085634	**2**	9085627	**5**	9085638	**8**
Row 25	9065038	**3**	9065039	**8**	9085634	**4**
Row 26	Guard Row		Guard Row		Guard Row	

Uniform growth describes stand as dense or sparse.

Rating: 1-Excellent / 3-Good / 5-Fair / 7-Poor / 9-Very Poor / 0-None

These are seed collections with their accession numbers from the counties in which they originated.

9085630 – Burleson Co., Texas
9065036 – Mills Co., Texas
9085627 – Brazos Co., Texas
9085626 – Hunt Co., Texas
9085656 – Murray Co., Oklahoma
9085633 – Panola Co., Texas
9085639 – Grayson Co., Texas
9065048 – Hunt Co., Texas
9065046 – Limestone Co., Texas
9065003 – Montague Co., Texas
9065047 – Kaufman Co., Texas
9085628 – Brazos Co., Texas
9085644 – Taylor Co., Texas
9065032 – Brazos Co., Texas
9065033 – Hemphill Co., Texas
9065039 – Burnet Co., Texas
9085638 – Grayson Co., Texas
9085645 – Lampasas Co., Texas
9085636 – Parker Co., Texas
9064986 – Gonzales Co., Texas
9085637 – Johnson Co., Texas
9085635 – Nacogdoches Co., Texas
9085634 – Montague Co., Texas
9065038 – Milam Co., Texas

Literature Cited:

Gould, F.W., The Grasses of Texas. Texas A&M University Press, 1975, 205 p.

Study No. : TXPMC-P-0501-RA - North Texas Ecotype Project

Objective: The North Texas Ecotype Project (NTEP) is to inventory prairie remnants and form a network of landowners willing to allow native seed harvest. Another key of NTEP is to increase the availability and diversity of native plant ecotypes through seed increase program. Plant materials will be increased based on soil order and plant taxonomy (i.e. variety). Site collections will be stored at the USDA-NRCS Plant Materials Center (PMC) near Knox City, Texas. These collections will be used to establish foundation seed fields that will eventually provide seed to commercial seed dealers and cooperators for large-scale production.

Target Areas: This project is a coordinated effort with the Texas AgriLife Research Station in Stephenville, Texas, Tarleton State University in Stephenville, Texas, Texas Parks & Wildlife, James E. “Bud” Smith PMC near Knox City, Texas, U.S. Fish & Wildlife Service, U.S. Department of Agriculture, and Natural Resources Conservation Service. NTEP targets 43 counties located within all or portions of 6 vegetational areas in north-central Texas: Blackland Prairie, East Cross Timbers, Fort Worth Prairie, Lampasas Cut Plain, West Cross Timbers and Rolling Plains.

Progress or Status: At this time, the PMC maintains the collections of the native plant seeds from the NTEP Plant Coordinator. There are approximately thirty-five collections of seeds stored in the seed room at the PMC near Knox City. Texas. Currently, NTEP is waiting for funds to continue collecting, planting and evaluating for use in revegetation project.

Study No. : TXPMC-T-0601-RA - Growth Curve Study

Objective: To provide information on forage and nutritive quality distribution of native, perennial, warm-season grass cultivars and selections released by the NRCS/James E. “Bud” Smith Plant Materials Center near Knox City, Texas under low and high fertility management.

Evaluation Factors: Each perennial grass species is seeded in a 7 feet x 32 feet plot in a randomized complete block design replicated 3 times at the Plant Materials Center. The plots are subdivided into eight, 3.5 feet x 8 feet quadrants. The quadrants are assigned an evaluation and monthly clipping that occur from April through November (Table 6.1). The grass entry for this study consists of seven warm-season grasses, one introduced and six native plants (Table 6.2). The plots assigned with High Fertility are fertilized with nitrogen and phosphorus and the Low Fertility plots are fertilized with phosphorus.

Table 6.1

Plot Layout for Growth Curve Study

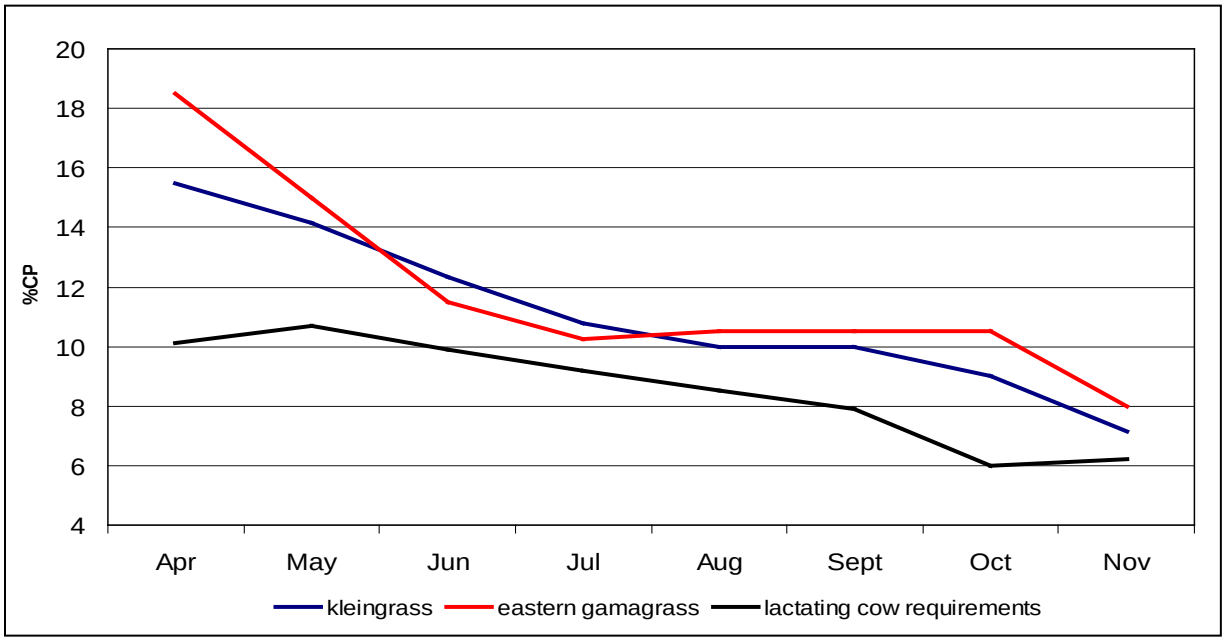
Rep 1					Rep 2					Rep 3				
	Low Fertility					Low Fertility					High Fertility			
Alamo	Apr	Aug	Oct	June	**Up Swg**	Aug	Apr	Sep	Nov	**Haskell**	Oct	Sep	Nov	June
	Nov	Jul	May	Sep		June	Jul	May	Oct		May	Apr	Jul	Aug
Earl	Sep	June	Nov	May	**Haskell**	Apr	Aug	Oct	June	**Alamo**	Sep	Aug	Jul	Oct
	Aug	Apr	Jul	Oct		Jul	May	Nov	Sep		Nov	May	Apr	June
Select 75	Nov	Apr	May	Aug	**Select 75**	Jul	Sep	Nov	June	**Lometa**	Nov	Sep	Oct	Jul
	Jul	Oct	June	Sep		Oct	Apr	May	Aug		June	Apr	Aug	May
San Marcos	May	Sep	Oct	Aug	**Earl**	Nov	Aug	Oct	Sep	**San Marcos**	Jul	Sep	Nov	Oct
	Jul	Nov	Jun	Apr		Apr	May	June	Jul		Apr	May	June	Aug
Haskell	Jul	Oct	Aug	Sep	**Lometa**	May	June	Oct	Jul	**Up Swg**	May	Sep	Nov	Aug
	May	Jun	Apr	Nov		Nov	Aug	Apr	Sep		Oct	Jul	Apr	June
Up Swg	Jul	Aug	Apr	May	**San Marcos**	Apr	Sep	Nov	Aug	**Earl**	June	Sep	Aug	Oct
	June	Oct	Sep	Nov		May	Jul	Oct	June		Apr	Jul	May	Nov
Lometa	June	Sep	Jul	May	**Alamo**	May	Aug	Sep	June	**Select 75**	Jul	Sep	June	Nov
	Aug	Nov	Oct	Apr		Nov	Jul	Apr	Oct		Apr	Oct	May	Aug
	High Fertility					High Fertility					Low Fertility			
Up swg	Apr	June	Sep	Aug	**Haskell**	Aug	Apr	Oct	Jul	**Earl**	Nov	June	Oct	July
	Jul	May	Nov	Oct		Nov	June	May	Sep		May	Aug	Apr	Sep
San Marcos	Nov	Jul	Oct	June	**Alamo**	Oct	Sep	Aug	May	**San Marcos**	Jul	June	Sep	Aug
	Apr	Aug	May	Sep		Nov	Jul	June	Apr		Apr	Nov	May	Oct
Select 75	Aug	Jul	Sep	Apr	**Earl**	Jul	May	Oct	June	**Lometa**	Sep	Jul	Oct	Apr
	May	Nov	June	Oct		Sep	Apr	Aug	Nov		June	May	Aug	Nov
Haskell	Nov	Oct	Jul	June	**Up swg**	Apr	Aug	Jul	June	**Select 75**	Nov	Aug	Sep	June
	Aug	Apr	May	Sep		May	Oct	Nov	Sep		Apr	July	May	Oct
Lometa	Jul	Sep	Aug	Nov	**Lometa**	Nov	Aug	June	Oct	**Alamo**	June	Oct	Nov	Sep
	June	Apr	May	Oct		May	Jul	Apr	Sep		May	Aug	Jul	Apr
Alamo	Jun	Nov	Jul	Oct	**San Marcos**	Sep	Apr	Oct	Aug	**Up Swg**	Oct	Jul	Nov	June
	Aug	Sep	Apr	May		Nov	Jul	June	May		Apr	May	Aug	Sep
Earl	Sep	Apr	Oct	June	**Select 75**	Sep	Aug	Oct	Nov	**Haskell**	Apr	Oct	June	Aug
	Aug	May	Jul	Nov		Jun	Jul	May	Apr		Jul	Nov	May	Sep

Table 6.2

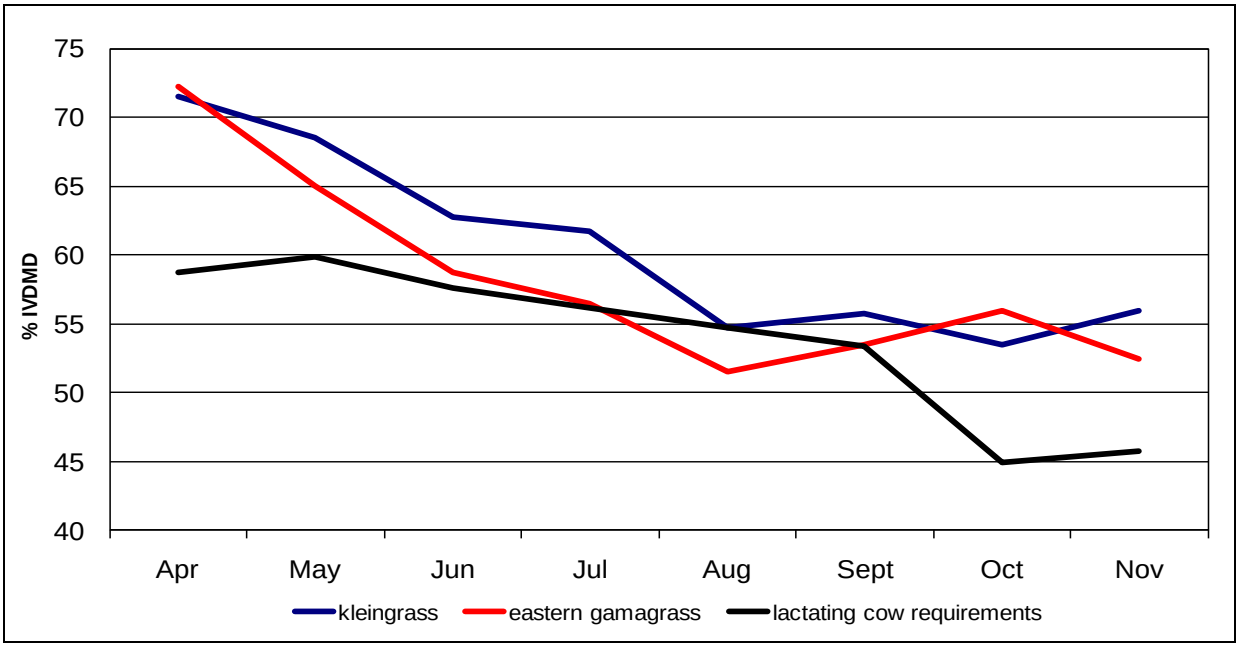
Variety	Common Name	Species

‘Alamo’	switchgrass	*Panicum virgatum*
‘Earl’	big bluestem	*Andropogon gerardii*
‘Lometa’	Indiangrass	*Sorghastrum nutans*
‘Selection 75’	kleingrass	*Panicum coloratum*
‘San Marcos’	eastern gamagrass	*Tripsacum dactyloides*
‘Haskell’	sideoats grama	*Bouteloua curtipendula*
9065018 (upland type)	switchgrass	*Panicum virgatum*

Progress or Status: Evaluations and clippings from each plot were conducted in 2009.



Crude protein of kleingrass and eastern gamagrass from April-November and the crude protein needs of a 1200 pound lactating cow (March calving) (NRC 1996).



Digestibility of kleingrass and eastern gamagrass from April-November and digestibility needs of a 1200 pound lactating cow (March calving) (NRC 1996).

Summary

The statistical data was collected at the James E. "Bud" Smith Plant Materials Center near Knox City, Texas. This information is to be used in general comparisons between species and sites and may not reflect actual results at all locations in Texas.

Crude protein and digestibility of kleingrass and eastern gamagrass decreased monthly as the phenological growth stage of the grasses changed from vegetative to seed maturity. Forage quality estimates were highest in April – July (vegetative and boot stage) and declined as the grasses reached reproductive stage. Under proper utilization and management, these two warm season grasses can provide the nutritional needs of various beef cattle classes as illustrated in the National Research Council Crude Protein and Digestibility Needs table below.

The chart below represents the nutritional needs for various classes of beef cattle. (CP represents crude protein that is the total protein content demand and DOM is digestible organic matter demand. This chart can be used a reference in comparing plant performance versus the different beef cattle class nutritional demands.

Crude Protein and Digestibility Needs of Different Beef Classes (National Research Council, 1996)

Beef Cattle Class	Age	Weight	CP	DOM
		-----lb-----	----------%----------	
Steer*	7 mo	500	15	63
Heifer*	8 mo	500	14	59
Dry cow	5 - 10 yr	1200	7	52
Lactating cow	5 - 10 yr	1200	10	58
Mid pregnant cow	5 - 10 yr	1200	9	57

*** 1.5 lb/day gain**

Reference

National Research Council. 1996. Nutrient requirements of beef cattle. 7th ed. National Acad. Press, Washington, DC.

Study No. : TXPMC-T-0701-BF - Biofuel Study

Objective: There is limited information available on biofuel quality and biomass yield of warm season grasses in relation to effects of weathering in the field throughout the winter. Cultivars and selections of perennial, warm-season grasses will be compared in replicated plots to evaluate the effects of fall, winter, and early spring harvest on dry matter production, biofuel quality and plant adaptation.

Evaluation Factors: The propagules of miscanthus were transplanted on 4/4/2007. The grass seeds of switchgrass, big bluestem and Indiangrass were planted with the recommended seeding rate on 5/15/2007 (Table 7.1). This ground site had rye growing and tilled in 2006 and 2007 prior to establishment.

Location James E. "Bud" Smith Plant Materials Center

Study Leader Esquivel, R., Douglas, J.

Duration 2007 through 2011

Cooperators CNTSC, Fort Worth, TX; ARS, Temple, TX; Elsberry, MOPMC; Mississippi State University, Starkville, MS

Land Use Cropland

Vegetative Practices Not applicable

Resource Concern(s)

Resource	Consideration/Problem
Soil	Erosion
Water	Water Quality
Air	Air Quality

Description Cultivars/selections of warm season grasses will be compared in replicated plots to evaluate the affects of fall, winter and early spring harvest affects on dry matter production and biofuel quality.

Status of Knowledge Dedicated energy crops grown for direct combustion or gasification to generate electricity; ethanol production for transportation fuel; or thermochemical conversion into other by products, require different biofuel quality (McLaughlin et al., 1996). For direct combustion or gasification, biofuel quality needs to have low concentration of alkali metals, especially potassium, low levels of total ash-forming materials, and higher calcium content to mitigate slagging and fouling of conventional boilers (Baxter et al., 1998, Miles et al., 1996).

Conversely, for ethanol fermentation and thermochemical conversion by gasification, the biofuel quality must have low moisture, nitrogen, and ash content and a high concentration of lignocellulose in the biomass (McKendry, 2002).

Time and frequency of harvest play a major role in biofuel quality. Nitrogen and ash content of 'Alamo' switchgrass (*Panicum virgatum* L.), 'Highlander' eastern gamagrass [*Tripsacum dactyloides* (L.) L.] and caucasian bluestem [*Bothriochloa baldhii* (Retz.) S.T. Blake] were reduced in a single fall harvest regime compared to a 2 harvest regime, which consisted of an early summer and early fall harvest in Mississippi (Grabowski et al., 2004). Deferring native grass species for two years in Canada produced the greatest biomass yield with highest cellulosic content for ethanol production as compared to 3 and 4 year deferral period, which seem to favor livestock forage for beef cattle (Jefferson et al., 1999). Exposing standing biomass to natural field weathering has shown to be advantageous for achieving biofuel quality. Delaying switchgrass harvest from the fall to spring in Pennsylvania reduced moisture and mineral content to a level suitable for all biofuel conversion systems (Alder et al., 2006). However, these authors reported lower yields due to loss of leaves and panicles during the winter months, and difficulty during the harvesting operations because of the brittleness of the biomass and lodging from snowfall. In contrast, Boe and Lee (2005) found little to no difference in biomass yield in the northern Great Plains from fall to spring, but clipping height was adjusted from 10 cm in the fall to near ground level in the spring, resulting in higher yields due to heavier stems near the base of the plant.

Experimental Design

Randomized Complete Block, with 4 replications
Plot size –Based on a 40-inch row, 18 ft x 20 ft (7 rows) per plot.

Treatments

Grass species treated as whole plot and harvest dates subplot.

Materials and Methods

Species/cultivars or selections (see list below) from appropriate sources will be planted by seed or propagules (miscanthus) into plots containing 7 rows with 40" spacing and 20 feet long. Interior 5 rows will be clipped for biomass and grab samples for fuel quality estimates and outside rows will be border rows. Plots were planted in April/May 2007. Irrigation will be applied as needed during the establishment year only. Timing and rate of fertilizer amendments will be determined later.

Table 7.1

Cultivars/Selections and species to be tested	Seeding rate(seeds/row ft--#/ac
'Earl' big bluestem	50 PLS/row ft -
'Kanlow' switchgrass	50 PLS/row ft -
'Lometa' Indiangrass	50 PLS/row ft -
9083274 big bluestem (MOPMC)	50 PLS/row ft -
'Alamo' switchgrass	50 PLS/row ft -
Miscanthus (sterile)	3 ft spacing within and between rows

(seeding rate amounts used in 20 ft rows)

Supporting evaluations
Stems or plants per row foot at end of first growing season

Harvest Treatments
A 14' 6" swath will be clipped from the center of each plot beginning at seed maturity (2008-2010) and every six weeks until spring in (2009-2011). See table 7.2 for clipping dates.

Progress or Status: The study was planted in a randomized complete block design with four replications. In the early fall of 2008 the first clipping was conducted when plants matured and six weeks thereafter till early spring. The clipped materials were sent to Mississippi State University to Dr. Brian Baldwin to have analyzed for biofuel quality of N, lignin, ADF, NDF, ash (total) caloric value, Ca, Mg, S, P, K, gross energy.

Harvest dates of warm season grass entries at the USDA-NRCS James E. "Bud "Smith Plant Materials Center, Knox City, Texas, 2008-2009.

Entry	Harvest Dates				
	1st 1/	2nd	3rd	4th	5th
Alamo switchgrass	25 September	11 November	17 December	30 January	10 March
Kanlow switchgrass	25 September	11 November	17 December	30 January	10 March
Giant miscanthus2/	25 September	11 November	17 December	30 January	10 March
Earl big bluestem	6 November	19 December	2 February	10 March	8 April
Lometa Indiangrass	6 November	19 December	2 February	10 March	8 April
Elsberry big bluestem	11 November	19 December	2 February	10 March	8 April

1/ - first harvest was made at 50% seed maturation. Subsequent harvests were made approximately every 6 week intervals. 2/ - giant miscanthus does not produce fertile seed; therefore, the harvest date coincides with seed maturity date of the switchgrass cultivars.

Yield of warm season grasses by harvest at the USDA-NRCS James E. “Bud “Smith Plant Materials Center, Knox City, Texas, 2008-2009.

	Warm Season Grasses					
Harvest	Alamo	Kanlow	Miscanthus	Earl	Elsberry	Lometa
	----------lb/acre----------					
1st	5883 a[1/]	4176 a	562 a	2801 a	2094 a	4196 a
2nd	6562 a	4503 a	294 a	2408 ab	2415 a	3796 ab
3rd	5689 a	4167 a	270 a	2563 a	1947 ab	3944 a
4th	5783 a	4785 a	278 a	1869 b	2761 a	4044 a
5th	5303 a	4392 a	233 a	1924 a	1201 b	3283 b
Mean	5833	4405	327	2313	2084	3852

1/ - Different letters after the mean yield WITHIN a column indicate significant differences at the 0.05 level (P<0.05).

Study No. : TXPMC-P-0702-PA - Observational Planting Blue grama

Objective: The observational plantings for three accessions of blue grama, *Bouteloua gracilis* from the Manhattan Plant Materials Center is to determine the potential adaptation area for pasture/hayland use.

Evaluation Factors: Evaluate for percent stand, vigor, drought tolerance, insect problems, disease problems, seed production, and plant height.

Progress or Status: The three accessions from the Manhattan PMC are 421282, 421283, and 9050485. Evaluations were conducted for the third year on these three accessions on the traits mentioned above. At the end of the growing season, the evaluation worksheet with the data is submitted to the Manhattan PMC.

Study No. : TXPMC-P-0703-CR Observational Planting Big Sacaton

Objective: The observational planting for one accession of big sacaton, *Sporobolus giganteus,* from the Los Lunas Plant Materials Center is to determine the area of adaptation for cropland use.

Evaluation Factors: Evaluation of percent stand, vigor, drought tolerance, insect problems, disease problems, seed production, and plant height.

Progress or Status: The accession from Los Lunas PMC is SPF-04-F 10 & 13. The third year's evaluations were made this year. At the end of the growing season, the evaluation worksheet with the data is submitted to the Los Lunas PMC.

Study No. : TXPMC-P-0704-RA/PA ARS, Woodward OK; Sand bluestem Project

Objective: Evaluate sand bluestem germplasm lines under field conditions bred for improved germination and establishment for southern plains and pasture landscapes.

Evaluation Factors: Establishment of sand bluestem is difficult and wide variation over years is expected. Annual differences in establishment conditions will be beneficial for the study. However, if extreme negative conditions (i.e., either too wet or too dry) occur over two or more years, we will consider extending the length of the experiment. The general experimental approaches should be adequate to achieve the objective. Plant emergence evaluation of the small-scale plot of the sand bluestem accessions will be taken every thirty days for 3 months, after each planting.

Progress or Status: In the spring of 2007, Dr. Tim Springer with the Agriculture Research Station in Woodward, Oklahoma planted a plot of germplasm lines of sand bluestem at the Plant Materials Center for emergence evaluations. On April 22, 2008, Dr. Springer planted another plot of germplasm lines of sand bluestem at the Plant Materials Center to evaluate for emergence. The PMC staff will maintain the plots for further for adaptation evaluation.

Experimental Design: Recurrent phenotypic mass selection was used to create two synthetic populations from two lines of sand bluestem developed at the SPRRS, Woodward, OK. The base populations, designated 'AB Medium' and 'CD Tall', were originally selected for growth and regrowth, disease incidence, leafiness, seedling vigor, and plant height. AB Medium (Syn-0 population) was released as 'Chet' sand bluestem in 2004 and a detailed description of the selection procedures is outlined by Springer et al. (2005).

The selection criterion was to select seed/plants that germinated at low water potentials. About 3,500 chaffy pure-seeds of each bluestem line was germinated in a germination chamber (Stultz Scientific Engineering Corp., Springfield, IL) set for 8 h d^{-1} of fluorescent light at 30 ^{o}C and 16 h d^{-1} of darkness at 20 ^{o}C. For each bluestem line, 100 seeds were placed in sterile, clear plastic boxes (11.0 x 11.0 x 3.5 cm; Tri-State Plastics, Inc., Henderson, KY) on two layers of paper towel substrates moistened with 17 mL of a water potential solution of D-mannitol at -0.8 MPa. At the end of 7 d, all germinated seeds were removed, washed with deionized water and planted into 64-cell cavity trays containing a soil mix and maintained in the greenhouse until field planting. Seeds were considered germinated if the seedling root and shoot were at least 2 mm long. About 7% of the 3,500 chaffy pure-seed germinated in 7d at a water potential of -0.8 MPa. Two cycles of selection were made yielding two populations plus the base population. The base population was designated Syn-0, the first selected population was designated Syn-1, and the second selection was designated Syn-2.

In October 2004 to 2006, seeds of each population were harvested with a Woodward Flail-Vac Seed Stripper, scalped with a Woodward High Intensity Seed Scalper, and classified with Woodward Seed-Material Classifier (Dewald et al., 1983; Ag-Renewal, Inc., Weatherford, OK). This harvesting and cleaning process produced a chaffy-seed product with about 60% pure seed.

The testing will involve planting the six populations in a randomized complete block design replicated four times. The plot size will be 2 x 10 m and the seeding population will be equivalent to 108 pure live seed per square meter. The experiment will be conducted at the SPRRS, Woodward, OK on an Eda loamy fine sand (Mixed, thermic Lamellic Ustipsamments) soil, at the USDA-NRCS, Manhattan Plant Materials Center, near Manhattan, KS (39° 12' N, 96° 35' W, elevation 325 m) on a Haynie silt loam (Coarse-silty, mixed, superactive, calcareous, mesic Mollic Udifluvents) soil, and at the USDA-NRCS, Knox City Plant Materials Center, near Knox City, TX (33° 35' N, 100° 02' W, elevation 503 m) on a Altus fine sandy loam (Fine-loamy, mixed,

superactive, thermic Pachic Argiustolls) soil. At 30-d, 60-d, and 90-d after planting, seedling emergence (plants m^{-2}) will be made using the methods of Vogel and Masters (2001). Plantings will be made on or near 1 June in 2007-2009 and a preemergence application of atrazine [2-chloro-4-ethylamino-6-isopropylamino-s-triazine] for weed control will be applied at 2.2 kg ha^{-1}. From the 2007 seeding, the forage dry matter yield of each plot will be determined in 2008 to 2010 by harvesting a 1.2 x 6.0 m area from the center of the plot to a stubble height of 10 cm. The plot will be weighed fresh and a 250 to 300 g sub-sample of forage collected for dry matter determination. Forage sub-samples will be oven-dried at 60 ºC. The dry matter yield of each plot will be calculated by multiplying the percentage dry matter of the oven-dried sub-sample by the harvested green weight of the plot and converted to kg ha^{-1}. Oven dried sub-samples will be ground to pass a 1-mm screen. Crude protein will be determined using an Elementar vario MAX CN analyzer (Elementar Americas, Inc., Mt. Laurel, NJ) and IVDMD will be determined using the procedures of Tilley and Terry (1963) as modified by White et al. (1981). Seedling emergence data will be analyzed as a mixed model analysis of variance with blocks within days after seeding as random effects and days after seeding as a repeated measure (Littell et al., 1996; SAS Institute, 1999). Fixed effects will be population and location and location x population interactions. Forage production and quality data will be analyzed as a mixed model analysis of variance with blocks within year as random effects and year as a repeated measure (Littell et al., 1996; SAS Institute, 1999). Fixed effects will be population and location and location x population interactions.

Study No. : TXPMC-S-0705-OT The Nature Conservancy

Objective: The Texas Nature Conservancy, in managing its Clymer Meadow preserve, has a need to preserve the native plant resources, to revegetate disturbed lands within to preserve and to avail seedstock to other landholders connected to the preserve by proximity or hydrology. NRCS has the personnel and is equipped to propagate and clean quantities of seed sufficient to meet the Texas Nature Conservancy

Progress or Status: See 2009 total seed production in Table 8.1. Eastern gamagrass was fertilized and irrigated, but did not produce viable seed.

Table 8.1

2008 TNC Seed Harvest		Bulk	PLS
9065019	Eastern gamagrass	47.25 Bulk lb.	17.94
9065018	Switchgrass	14.00 Bulk lb.	6.9
9085664	Indiangrass	36.50 Bulk lb.	23.6

Study No. : TXPMC-P-0706-RA Observational Planting Lavaca Germplasm Canada wildrye

Objective: The observational planting for Lavaca Germplasm Canada wildrye, *Elymus canadensis* from the Kika de la Garza Plant Materials Center is to determine the potential use and adaptation area for pasture/hayland use.

Evaluation Factors: Evaluate for percent stand, vigor, drought tolerance, insect problems, disease problems, seed production, and plant height.

Progress or Status: The Lavaca Germplasm from the Kika de la Garza PMC near Kingsville, Texas was evaluated for the second year on the traits mentioned above. At the end of the growing season, the evaluation worksheet with the data is submitted to the Kika de la Garza PMC.

Study No. : TXPMC-P-0803-RA Legume Trial

Objective: Evaluate three sources of prairie acacia for seed and herbage yield, forage nutritive value, and effect of forage harvest on seed yield. The seed sources are a composite developed at the Kika de la Garza PMC near Kingsville, Texas, Plains Germplasm from the James E. 'Bud' Smith PMC near Knox City, Texas, and STPA05 from Texas AgriLife Research Station in Stephenville, Texas. Two other seed sources will also be evaluated: Crockett Germplasm herbaceous mimosa, *Mimosa strigillosa* and Panicled tick-clover STPTC01, *Desmodium paniculatum* .The evaluation is to select a superior germplasm or selection and move to a cultivar release for the use of native perennial herbaceous legumes for inclusion in forage, rangeland and wildlife seed mix in the southern Great Plains. End-uses include rangeland restoration, native prairie reconstruction, CRP plantings, and wildlife habitat restoration.

Evaluation Factors: The experiment will take place at multiple locations covering latitudes and longitudes (table 9.1) that will define prairie acacia limits of adaptation. Soil amendments and irrigation will not be applied in an effort to evaluate adaptation to local edapho-climatic conditions. At the PMC near Knox City, Texas a test plot of the three prairie acacias, mimosa, and tickclover were planted in the spring of 2008. See table 9.2 for seed source. The following is the plot design.

Plots will be 2 m X 4 m and arranged in a randomized complete block design. There will be 3 replications (3 reps X 5 seed sources X 2 harvest treatments = 30 plots). There will be 5 rows per plot (Hege small plot seeder) on 25 cm spacing. Seed will need to be scarified and then inoculated with specific inoculum and the panicled tick-clover will be inoculated with a general cowpea inoculant. Initial seeding rate will be 30 seeds per row then thinned to 15 plants per row once plants reach a height of 10 cm. If necessary, irrigation may be used to aid establishment up to 10-cm height. Plots will be clean tilled and seeds placed at a 2-cm depth. Past experience has shown prairie acacia to be very sensitive to herbicides and even crop oil (herbicide surfactant). Therefore, only mechanical weed control will be used the first year and Prowl used as a spring pre-emergent the second year before plants re sprout. The experiment will encompass a minimum of two growing seasons (establishment and post-establishment).

The inner $1m^2$ of half of each plot (harvested sub-plot) will be clipped leaving the remaining sub-plot area as a border (which is also cut and discarded). Herbage will be harvested at 10-cm stubble from half the plots whenever 25% of the plants in the inner 3 rows of each entry bloom (as well as just prior to winter regardless of bloom); the different entries may be harvested at different times but all replications of that entry must be harvested at the same time. The mimosa will be clipped at 3-cm height leaving only the stolons. The number of individual plants within the $1m^2$ will be registered where plot cover is incomplete. Plant material from multiple harvests will be batched for each season by plot after registering dry matter weights for individual harvests. Harvested plots will be included in herbage yield and forage nutritive value (N, and Ankom in sacco disappearance be performed at Stephenville; samples dried at 55° C and ground through a 1-mm screen of a sheer mill).

All plots will be included in the seed production measurement, which will consist of harvesting mature seed before they drop from the plant. Seeds from the harvested and no-harvest sub-plots should be kept separate. Seeds will be collected throughout the season, stored in paper bags in a cooler (to avoid insect damage), batched by year, and sent to Stephenville at the end of each year for cleaning, weighing and counting.

Table 9.1

Locations
Stephenville TX, AgriLife Research Center

Overton TX, AgriLife Research Center
Ardmore OK, The Noble Foundation
Knox City TX, PMC
Homer LA, Louisiana Experiment Station
Nacogdoches TX, PMC
Amarillo TX, AgriLife Research Center
Beeville TX, AgriLife Research Center

Table 9.2

Seed source
Plains Germplasm prairie acacia, *Acacia angustissima,* Knox City PMC Composite
Acacia angustissima, Kingsville PMC composite
Acacia angustissima, Stephenville AgriLife Research line STPA05
Crockett Germplasm herbaceous mimosa, *Mimosa strigillosa*
Panicled tick-clover STPTC01, *Desmodium paniculatum*

Progress or Status: A plant count was conducted in each plot on May 21, 2009, after plants germinated. Another plant count was taken in the fall of 2008, before the first freeze. Plots were given another year to fill in before clippings would be done.

KCPMC-Knox City										
					E					
	D		B		D		A		B	
N	D		E		B		E		A	**S**
	C		A		C		E		C	
					W					
A	STPA 05									
B	Plains PA									
C	Kings PA									
D	Mimosa									
E	Tickclover									

Study No. : TXPMC-T-0807-RA ICST-Alkali sacaton

Objective: Evaluate the Tucson PMC's Vegas Germplasm alkali sacaton, *Sporobolus airoides* with three other alkali sacaton's for adaptability in an Inter-Center Strain Trial Study. The other three are 'Salado', 'Saltalk' and a California accession.

Evaluation Factors: Plants will be evaluated for stand evaluation at the end of season, survival, date dormancy ends (if goes dormant), date of flowering, date of harvest, forage (fresh and dry weight) 1 linear meter clipped from each row, and seed production from each plot.

Progress or Status: The Tucson PMC staff assembled the samples of seed with the correct amount to seed 50 feet long rows. Seeds were planted in plots in rows, 40 inches apart, replicated 4X and four treatments (accessions) on 5/21/2008. No seed was actually harvested, but harvest date evaluations were made. Evaluations will be made again next year as well as actual seed harvest.

Alkali sacaton
Inter-Center Strain Trial (ICST)
Plot Layout – D Block
5/21/2008

Table 10.1 Plot layout of alkali sacaton **North**

Accessions	1	1	1	1	3	3	3	3	4	4	4	4	2	2	2	2	Rep 4
Accessions	4	4	4	4	2	2	2	2	3	3	3	3	1	1	1	1	Rep 3
Accessions	3	3	3	3	1	1	1	1	2	2	2	2	4	4	4	4	Rep 2
Accessions	2	2	2	2	4	4	4	4	1	1	1	1	3	3	3	3	Rep 1
Rows	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	

South

Entry=Accessions
1=CA Accession
2=NM Accession (Salado)
3=AZ Accession (Vegas)
4=TX Accession (Saltalk)

Alkali sacaton (ICST) Evaluation 4/24/2009
% Stand Evaluation

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
%		5	1			5	50			45	40			15	3		Rep
Accession	1	1	1	1	3	3	3	3	4	4	4	4	2	2	2	2	4
%		1	5			5	85			15	1			5	2		Rep
Accession	4	4	4	4	2	2	2	2	3	3	3	3	1	1	1	1	3
%		1	3			5	15			15	1			25	15		Rep
Accession	3	3	3	3	1	1	1	1	2	2	2	2	4	4	4	4	2
%		10	10			20	30			5	2			2	1		Rep
Accession	2	2	2	2	4	4	4	4	1	1	1	1	3	3	3	3	1

Alkali sacaton (ICST) Evaluation 4/24/2009
Survival Evaluation

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
% Accession	1	91	91	1	3	93	53	3	4	54	54	4	2	92	92	2	Rep 4
% Accession	4	94	94	4	2	92	22	2	3	93	93	3	1	91	91	1	Rep 3
% Accession	3	93	93	3	1	91	91	1	2	92	92	2	4	74	94	4	Rep 2
% Accession	2	92	92	2	4	74	74	4	1	91	91	1	3	93	93	3	Rep 1

Alkali sacaton (ICST) Evaluation 6/5/2009-6/8/2009
Date of Flowering

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Date Accession	1	6/8/091	6/8/091	1	3	6/5/093	6/5/093	3	4	6/5/094	6/5/094	4	2	6/8/092	6/8/092	2	Rep 4
Date Accession	4	6/5/094	6/5/094	4	2	6/8/092	6/8/092	2	3	6/5/093	6/5/093	3	1	6/8/091	6/8/0991	1	Rep 3
Date Accession	3	6/8/093	6/8/093	3	1	6/8/091	6/8/091	1	2	6/8/092	6/8/092	2	4	6/5/094	6/5/094	4	Rep 2
Date Accession	2	6/8/092	6/8/092	2	4	6/5/094	6/5/094	4	1	6/8/091	6/8/091	1	3	6/8/093	6/8/093	3	Rep 1

Alkali sacaton (ICST) Evaluation 6/25/2009-6/28/2009
Survival Evaluation

Row	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Date Accession	1	6/28/091	6/28/091	1	3	6/25/093	6/25/093	3	4	6/25/094	6/25/094	4	2	6/28/092	6/28/092	2	Rep 4
Date Accession	4	6/25/094	6/25/094	4	2	6/28/092	6/28/092	2	3	6/25/093	6/25/093	3	1	6/28/091	6/28/091	1	Rep 3
Date Accession	3	6/28/093	6/28/093	3	1	6/28/091	6/28/091	1	2	6/28/092	6/28/092	2	4	6/25/094	6/25/094	4	Rep 2
Date Accession	2	6/28/092	6/28/092	2	4	6/25/094	6/25/094	4	1	6/28/091	6/28/091	1	3	6/28/093	6/28/093	3	Rep 1

Study No. : TXPMC-T-0901-ICST- Arizona Cottontop

Objective: Arizona cottontop has multiple releases and accessions, either in commercial production, recently released, or under current development. This study will compare three different accessions from the South Texas PMC, Arizona PMC, and Knox City PMC.

Evaluation Factors: Plants will be evaluated for stand evaluation at the end of season, survival, date dormancy ends (if goes dormant), date of flowering, date of harvest, forage (fresh and dry weight) 1 linear meter clipped from each row, and seed production from each plot.

Progress or Status: Study was established in the spring of 2009. First planting was done with Kincaid plot planter on May 22, 2009. Dry conditions caused multiple skips which were replanted on July 1, 2009. Irrigation was provided to establish plots, but no data was taken the first year.

		North		
Loetta AZPMC	PMT-389 KCPMC	La Salle STXPMC	Loetta AZPMC	
PMT-389 KCPMC	La Salle STXPMC	Loetta AZPMC	PMT-389 KCPMC	
La Salle STXPMC	Loetta AZPMC	PMT-389 KCPMC	La Salle STXPMC	
Rep 1	**Rep 2**	**Rep 3**	**Rep 4**	
		South		
	Total Planting Area = ~ 0.22 acres			
	Each Rep is 4 rows, 40" apart			
Remarks: Planted on 5/22/2009 with Kincaid Plot Planter. Four rows per plot.				

Study No.: TXPMC-T-0902-ICST- 'Tropic Sun' Sunn Hemp

Objective: This study will determine the areas of the country with the potential to use sunn hemp for a green manure and cover crop. As a cover crop, sunn hemp can produce 5000-6000 pounds of biomass per acre in 60-90 days. It can also produce 120-140 lbs of nitrogen in the same period of time.

Evaluation Factors: Study is planted in four reps with 30-60-90 day intervals being in each rep. During each clipping, plant height will be measured. Then, three 0.5 m2 clippings will be made in each rep. Sample will be weighed, then a grab sample will be taken, weighed, and dried to determine percent of dry matter. Weights will be used to determine yield per acre.

Progress or Status: Sunn Hemp study was planted on May 19, 2009. Four clippings were taken at 30-60-90 days after emergence and the final clipping after the first killing frost. Data from the clipping is recorded in the table below. Study had over 31 inches of moisture both from irrigation and rainfall throughout the growing season. Plant heights reached above twelve feet and yields were recorded around the 5000-6000 lb. range.

Sunn Hemp Adaptation Trial

PMC: TXPMC

Planting Da 5/19/2009 **Date of Complete Stand (at least 70% emergence)_____** 5/24/2009

Plot#	Rep	Harvest date	Plt ht (in)	0.5 m^2 Plot wt Sample 1 (g)	0.5 m^2 Plot wt Sample 2 (g)	0.5 m^2 Plot wt Sample 3 (g)	0.5 m^2 Avg. plot wt (g)	grab sample Wet wt (g)	grab sample Dry wt (g)	Pct dry weight of sample (decimal %)	Avg. 0.5m^2 plot dry weight (g)	Yield (lb/acre)
TX30	1	18-Jun	11	66.2	76	98.1	80.1	239.3	37.6	0.15712	12.58571	225
TX30	2	18-Jun	11	143.6	101.1	99.1	114.6	343.3	57.2	0.16662	19.09444	341
TX30	3	18-Jun	11	88.3	72.9	92.8	84.6667	253.5	40.9	0.16134	13.66022	244
TX30	4	18-Jun	13	172.2	187.9	64.1	141.4	423.9	68.9	0.16254	22.98292	410
TX60	1	17-Jul	45	403	419.7	641.7	488.133	504.8	109.4	0.21672	105.788	1887
TX60	2	17-Jul	51	580.9	690.2	557.8	609.633	447	78.9	0.17651	107.6064	1920
TX60	3	17-Jul	56	894.2	999.6	1058.9	984.233	338.4	62.5	0.18469	181.7807	3243
TX60	4	17-Jul	53	820	509.5	575.1	634.867	356.7	64.2	0.17998	114.2653	2038
TX90	1	17-Aug	78	588.8	400.4	727.6	572.267	289.8	98.3	0.3392	194.1125	3463
TX90	2	17-Aug	84	817.6	1186.7	868	957.433	311.3	92.5	0.29714	284.4927	5075
TX90	3	17-Aug	90	568.3	878.8	409.4	618.833	279.9	79.4	0.28367	175.5461	3132
TX90	4	17-Aug	78	563	566.3	548	559.1	285.2	81.6	0.28612	159.9669	2854
TXAF	1	30-Nov	149	455.2	845.1	779.8	693.367	255.8	174.7	0.68296	473.5385	8448
TXAF	2	30-Nov	132	540.4	549.9	605.2	565.167	236.3	138.8	0.58739	331.9726	5922
TXAF	3	30-Nov	135	440.3	494.7	315.4	416.8	254.4	167.9	0.65998	275.0814	4907
TXAF	4	30-Nov	140	385.4	750.1	810.4	648.633	353.9	212.1	0.59932	388.7401	6935

Note:
TX= James E. "Bud" Smith PMC
TX 30, TX 60, TX 90 = yield taken at 30, 60 and 90 days after planting
TXAF = yield taken after frost

Additional Notes:
Irrigated **19.2 inches**
Rainfall: **12.18 inches**
9-14-09: **First Bloom seen**
11-6-09: **Seed Pods Form, but no mature seed found**

Study No.: TXPMC-T-0903-BF ICST- Biomass Study

Objective: Switchgrass has been designated as one of the leading biomass energy crops for production, gasification, and liquid field production. The objective of this study is to compare biomass yield and fuel quality of warm season grasses to Maximilian sunflower as dedicated energy crops.

Evaluation Factors: A biomass harvest will be taken four weeks after the first frost by clipping a 14’5” sample. A grab sample will be taken and dried at 55’C for 24 hours. Then yield and % dry matter can be calculated. 100 grams of dried sample will be sent to Agri-Life in Stephenville, TX for chemical analysis.

Progress or Status: Planting was attempted on May 22, 2009 and again on June 24, 2009. In both cases, hot, dry weather made establishment difficult and new seedlings dried out and died. It was decided to postpone this study until 2010 when plants would be started in the greenhouse and transplanted into the field.

	Comparison of Warm Season Perennial Species for Biomass Production				
		Plot Layout B-2 Block			
		5/22/2009			
Entry					
1	Cimarron' switchgrass				
2	Falfurrias Germplasm big sacaton				
3	Alamo' switchgrass				
4	Aztec' Maximilian sunflower				
5	Prairie Gold' Maximilian sunflower				
			North		
Rep 4	**3**	**4**	**5**	**1**	**2**
Rep 3	**4**	**1**	**2**	**5**	**3**
Rep 2	**5**	**3**	**1**	**2**	**4**
Rep 1	**1**	**2**	**3**	**4**	**5**
			South		
Remarks: Planted on 5/22/2009 with two row Kincaid Plot Planter.					

Study No. : TXPMC-P-0904-RA Evaluation of vine-mesquite

Objective: Collection and evaluation for a superior plant for use as an improvement of range and pastureland, and provide for stabilization of soils that have high erosion potential.

Evaluation Factors: Plants will be evaluated for vigor, flowering date, and seed production.

Progress or Status: Sixty-one collections were submitted to the PMC along with accessions from the South Texas PMC. These collections were started in the greenhouse and will be transplanted into rod rows in 2010.

Scientific Name: *Panicum obtusum.*
Common Name: vine mesquite

Morphological Characteristics:

Habit- native, warm-season perennial grass, 8-24 inches tall; initiates growth in April to May; reproduces by seed, tillers, stolons, and rhizomes.
Inflorescence – panicle 1-1/4 to 6 inches long; 3/16 – ½ inch wide; branches erect, distant, usually unbranched
Spikelets – 2 florets, spikelet obovate, 1/8 – 5/32 inches long, glabrous, brown at maturity; upper floret indurate, glabrous, brownish
Awns – glumes, lemmas, and paleas awnless
Glumes – first and second glume nearly as long as spikelet, apex of both obtuse
Culms – erect, 8-24 inches tall, from a knotty or rhizomatous or stoloniferous base
Leaves – sheaths rounded with glandular papilla-based hairs; collar hairy, sometimes pilose on margins; blades firm, 2-8 inches long, 1/16 – 5/16 inch wide
Ligules – membranous, 1/32 – 1/16 inch long, apex erose
Other – The stolons of this grass may grow several feet long and have swollen woolly nodes. The brownish, round seeds lie close to the main seed stem forming a narrow seedhead. Often one leaf clings closely to the seedhead.
Habitat and Range: sandy or gravelly or clayey soils in areas of moisture accumulation. Texas distribution: throughout the state except MLRA 133B – Western Coastal Plain

Conservation Use:

Texas Plant Materials Centers have identified this plant as having potential benefits to the following conservation practice standards: 342 Critical Area Planting; 550 Range Planting; 647 Early Successional Habitat Development/Management; 391 Riparian Herbaceous Cover; 327 Conservation Cover.

Study No.: TXPMC-P-0905 Evaluation of Blue Grama

Objective: Collection and evaluation for a superior plant for use as an improvement of range and pastureland, and provide for stabilization of soils that have high erosion potential.

Evaluation Factors: Plants will be evaluated for vigor, flowering date, and seed production.

Progress or Status: Thirty-eight collections were submitted to the PMC. These collections were started in the greenhouse and will be transplanted into rod rows in 2010.

Scientific Name: *Bouteloua gracilis*
Common Name: Blue Grama

Morphological Characteristics:

-native, perennial, warm season bunchgrass that grows 6-26 inches tall
-found on dry slopes, plains, prairies, and foothills of most western states
-leaf blade is thin, flat, or infolded, .5-2 mm broad
-foliage color is gray-green
-flower color is yellow
-seed heads have 1-3 primary unilateral or comb-like branches 1.5-3 cm long
-branches have 40-130 tightly packed spikellets 4-7 mm long
-flower clusters are initially straight and green in color, but eventually dry and turn to a pale, blonde color
-adapted to a wide variety of soil types

Conservation Use: The James E. “Bud” Smith plant materials center has identified this plant as having potential benefits to the following conservation practice standards: 645 Upland Wildlife Habitat Management; 342 Critical Area Planting; 562 Recreation Area Improvement; 550 Range Planting; 512 Pasture and Hay Planting; 327 Conservation Cover. The planting of blue grama can provide excellent food and cover benefits for wildlife and livestock, as well as conserve our soil.

Study No. : TXPMC-P-0907-RA Evaluation of Three-flower melic

Objective: Collection and evaluation for a superior plant for use as an improvement of range and pastureland, and provide food and cover for wildlife.

Evaluation Factors: Plants will be evaluated for vigor, flowering date, and seed production.

Progress or Status: Currently, six collections of this species have been submitted to the PMC and will request another year of collection, before an initial evaluation study is initiated.

Scientific name: *Melica nitens*
Common name: Three-flower melicgrass

Morphological Characteristics:

Habit - Three-flower melicgrass is a perennial, cool season bunchgrass which grows 24 - 36 inches tall. This grass reproduces by seed mostly April to June.
Leaves – leaf blades may be smooth or with hairs, flat, 3 - 10 mm broad.
Inflorescence - panicle is mostly 10 – 26 cm long with lower branches usually compound, spreading or ascending.
Spikelets – much longer than broad (8 – 15 mm long)
Habitat and Range – Three-flower melicgrass is found from Pennsylvania to Iowa and Kansas, and south to Virginia, Arkansas, Oklahoma and Texas. In Texas, it is most often found in the Edwards Plateau and the North Central regions, but can be found west to the Trans-Pecos and East to the western portion of East Texas. It grows in open woods, on moist canyon slopes, in canyon bottoms, on rocky grasslands, as well as along stream banks and along roadsides. Three-flower melicgrass tends to prefer partial shade and calcareous or sandy loam soils.
Other - Three-flower melicgrass requires partial shade and medium amounts of water.
This bunchgrass is excellent for wildlife and the enhancement for water quality.

Conservation Use:

The James E. “Bud” Smith Plant Materials Center has identified this plant as having potential benefits to the following NRCS conservation practice standards: 391 Riparian Forest Buffer, 645 Upland Wildlife Habitat Management, 512 Pasture and Hay Planting, 342 Critical Area Planting and 550 Range Seeding.

Study No. : TXPMC-P-0908-RA Evaluation of showy menodora

Objective: Collection and evaluation for a superior forb plant for use as an improvement of range and pastureland, and provide food such as deer browse and cover for wildlife.

Evaluation Factors: Plants will be evaluated for vigor, flowering date, and seed production.

Progress or Status: Currently only two collections of this species has been submitted to the PMC and will request another year of collection, before an initial evaluation study is initiated.

Scientific Name: *Menodora longiflora.*
Common Name: showy menodora

Morphological Characteristics:

Habit- perennial, many-branched half-shrub, up to 18 inches high with woody base; seeds, borne four to a capsule, mature and shatter throughout the summer and early fall.
Leaves – mostly opposite but upper leaves sometimes alternate, usually entire but some lower leaves 2 or 3 lobed; up to 2 inches long.
Inflorescence – panicle 1-1/4 to 6 inches long; 3/16 – ½ inch wide; branches erect, distant, usually unbranched
Flowers – yellow with tube up to 2 inches long; 5-lobed; about 1 – 1-1/4 inches across; blooms from June to September.
Habitat and Range – dry, rocky hillsides, usually limestone but also igneous, canyons and ledges along streams in the Edwards Plateau and Trans-Pecos, southeastern New Mexico and Mexico from 1100’ to 6600’
Other – This is a species readily eaten by goats, sheep, and deer. It has been browsed out of some of its former area, but because of rocky habitat, it has persisted.

Conservation Use:

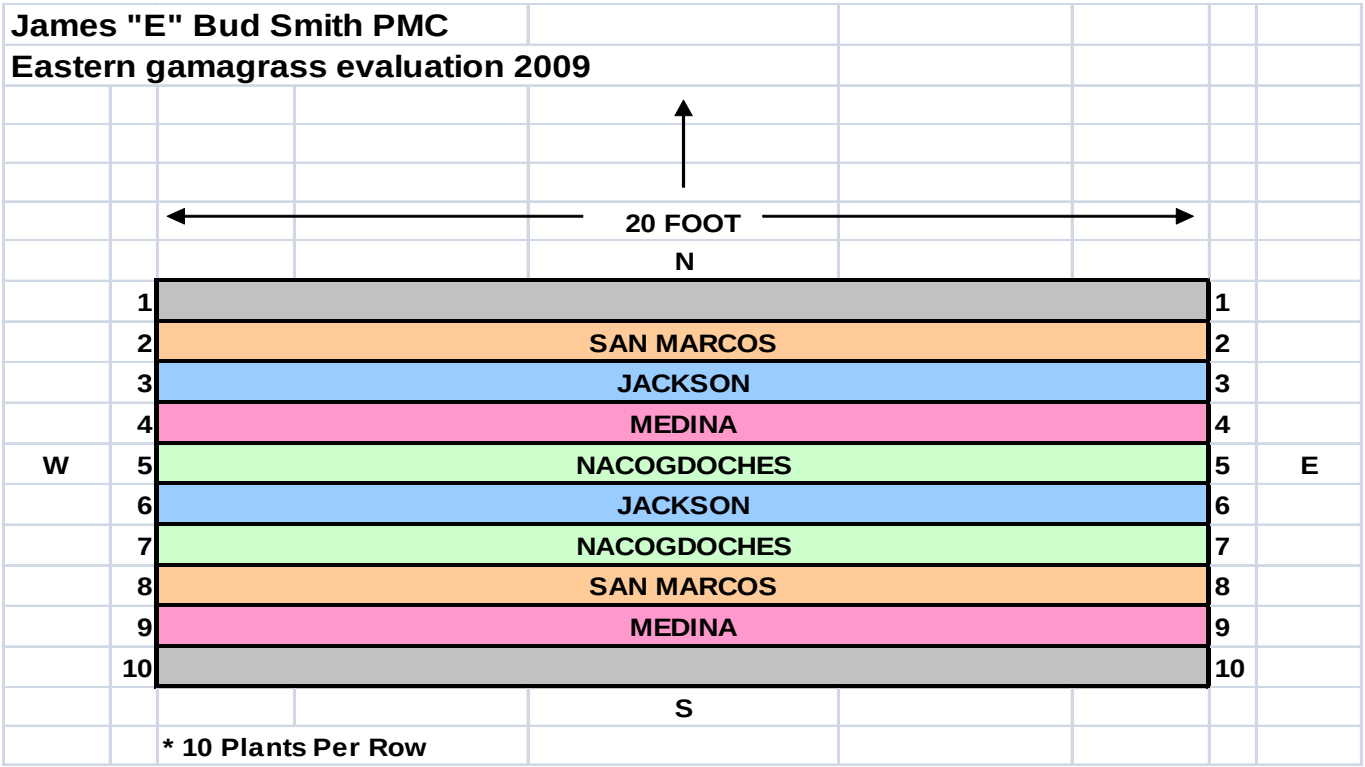
Texas Plant Materials Centers have identified this plant as having potential benefits to the following conservation practice standards: 342 Critical Area Planting; 550 Range Planting; 647 Early Successional Habitat Development/Management; 645 Upland Wildlife Habitat Management and 327 Conservation Cover.

Study No.: TXPMC-T-0909-PA ICST- Eastern Gamagrass

Objective: The objective of this study is to determine differences between four different releases of eastern gamagrass. The different releases are: San Marcos, Jackson, Medina, and Nacogdoches.

Evaluation Factors: Plant measurements will be taken on stems, leaves, heads, seed, to determine differences from one release to another.

Progress or Status: Plots were established this year. Plot layout is shown in map below. Irrigation was applied to aid in establishment. No data was collected this year.



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