United States Department of Agriculture

NRCS Natural Resources Conservation Service Plant Materials Program

2005 Progress Report of Activities

Booneville Plant Materials Center

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Introduction:

The Booneville Plant Materials Center (PMC) was established to serve the plant material needs of the Southern Ozarks, the Arkansas River Valley, the Boston and the Ouachita Mountains. The Center's priorities include protection and enhancement of water quality, protection and enhancement of pastureland, critical area treatment, protection and enhancement of woodlands, and protection and enhancement of wildlife land.

Location:

The Booneville Plant Materials Center is located in Logan County, Arkansas, in conjunction with the USDA-Agricultural Researches Service. The PMC leases, from the State of Arkansas, 282 acres located in the Arkansas River Valley.

Service Area:

The primary service area of the Booneville Plant Materials Center includes portions of Arkansas, Oklahoma, and Missouri (approximately 54 million acres). This area includes the following Major Land Resource Area's:

Ozark Highland	116A
Ozark Border	116B
Boston Mountains	117
Arkansas Valley and Ridges	118
Ouachita Mountains	119
Western Coastal Plain	133B
Alabama, Mississippi & Arkansas Blackland Prairie	135

Much of the service area is characterized by rugged terrain with elevations from 300 to 3,000 feet. Average annual rainfall varies from 36 inches in the west to 53 inches in the eastern higher mountain areas. Forage production and woodlands are the major land uses, and small family farms characterize the agriculture.

Staff:

Plant Materials Center Manager	Randy King
Assistant Manager	Lance Tharel
Secretary	Debbie Orick
Biological Sciences Technician	Eddie Pratt
Biological Sciences Technician	Dale Goff

Soils on the Center include:

Leadville silt loam, 1 to 3 percent slopes, This is a deep, moderately well drained, nearly level soil on old stream terraces in broad valleys. Individual areas range from about 10 to 400 acres in size.

Taft silt loam, 0 to 2 percent slopes. This is a deep, somewhat poorly drained, level to nearly level soil on old stream terraces in broad valleys. Individual areas range from about 10 to 400 acres.

Linker fine sandy loam, 3 to 8 percent slopes. This is a moderately deep, well-drained, gently sloping soil on hilltops. Individual areas range from about 5 to 200 acres.

Enders-Mountainburg association, rolling. This association consists of well-drained soils in a regular and repeating pattern on rolling hillsides. Slopes are 8 to 20 percent. The mapped areas on this association range from about 50 to 700 acres.

Studies:

Releases:

'Bumpers' eastern gamagrass
'OH-370' big bluestem

Release potential:

Big bluestem (cultivar will be released in 2007)

Technology Development:

Bermudagrass variety trial
Fruit and nut tree production (mined land)
Switchgrass Biofuels study (lowland types)
Switchgrass Biofuels study (upland types)

Arkansas Highway & Transportation Dept. (AHTD)

AHTD (Mountainburg I)
AHTD (Greenwood)
AHTD (Magazine)
AHTD (Mountainburg II)
AHTD (Mountainburg III)

Fort Chaffee Maneuvers Training Center (MTC)

MTC-1 Rehabilitation on Maneuver areas
MTC-2 Rehabilitation on Maneuver areas

Demonstrations:

Eastern gamagrass 'Pete' (Elm Park)
Eastern gamagrass 'Pete' (Altus)
Big bluestem 'Kaw' (Altus)
Switchgrass 'Alamo' (Altus)
Switchgrass 'Alamo' (on Center)
Eastern gamagrass 'Pete' (on Center)
Switchgrass 'Alamo' (Morrilton)
Native Grasses (University of Ark. Pine Bluff, Lonoke Research Farm)
Indiangrass 'Cheyenne' (on Center)
Native Grasses for the Unites States Forest Service (Cass)

Release of 'Bumpers' eastern gamagrass:

On May 6, 2005, during the celebration of the 25th anniversary of the Dale Bumpers Small Farms Research Center, the PMC Staff had the honor of announcing the release of 'Bumpers' eastern gamagrass. After being presented a plaque commemorating the event, Senator Bumpers commented that he had had colleges, streets, bridges and buildings named after him……but never a grass...

Accession 9058495 (Bumpers) has been tested at Booneville since 1990, and has been a part of the eastern gamagrass inter-center species trial in four southern PMCs since 1994. It was named 'Bumpers' for United States Senator Dale Bumpers (retired) who was instrumental in securing funding to set up, and support the Booneville Plant Materials Center.

'Bumpers' is recommended for forage production. It is best used as a hay crop, however, it can be grazed if given appropriate management such as rotational grazing. It also has potential as a perennial silage crop, a source of biomass for bio-energy production, and as a nutrient sink for water quality improvement.

Release Potential Summary:

Big bluestem Cultivar: Booneville will release a big bluestem cultivar for the Southern Ozarks in 2007. The selected accession went into advanced evaluation at Booneville, in 2003. Clone material was sent to five centers to evaluate range of adaptation these Centers were Jimmy Carter, Manhattan, Jamie L Whitten, Elsberry, and East Texas.

Technology Development Study Summaries:

Ft. Chaffee Maneuver area rehabilitation:
The second of three studies was planted at Ft. Chaffee in May. This study was designed to track economics of rehabilitating areas that have been disturbed by tracked vehicles. A heavy off-set disk was used to work down the ruts left by the vehicles. Cost per acre was established for the disking, and then the number of trips that it took to achieve a suitable seedbed was recorded. The area was planted with 'Kaw' big bluestem, 'Alamo' switchgrass, 'Cheyenne' indiangrass, and 'Pete' eastern gamagrass. Half of the area was mulched with 1.5 tons of grass hay mulch. The site will be harvested during summer 2006. Dry-matter yield and quality will be recorded. Ft. Chaffee will use the technology developed from these studies to write rehabilitation specifications for large tracts of disturbed land. After rehabilitation these tracts will be offered for lease to the public for hay production. The last planting on this contract is scheduled for March 2006.

Lowland Switchgrass for a Biofuel Source: A contract with the Department of Energy and a cooperative agreement with Dr. Charles Talafero (Oklahoma State University) as the principal investigator has resulted in the PMC testing Switchgrass for biomass production. 'Alamo', 'Cave-in-rock', 'Kanlow', along with seven of Dr. Talaferos' experimental lines were planted at Booneville in 1997, harvested annually, and reported to Talafero. The results are also reported annually to other cooperators along with a narrative summary of the study. An accession belonging to Dr. Talafero, consistently out yielded all other accessions and cultivars during the four year study. Booneville is now working with Talafero, to cooperatively release it as a cultivar.

Upland Switchgrass for a Biofuel Source: This study is identical to the above, with the exception of cultivar entries which are upland types. This study began in 2000, and will be completed in December. 2006. Dr. Talafero also provided the experimental upland lines.

Bermudagrass Variety Trial: In the last two to three years, the Arkansas State Cattleman's Association and other individuals have expressed a need for information relative to bermudagrass production. The University of Arkansas Agronomy Department discontinued bermudagrass cultivar testing in 1998. To fill this void, the Booneville PMC began (in 2000) establishing bermudagrass plots to collect dry-matter production, forage quality, ease of establishment and persistence data. The study contains the following entries; 'Common', 'Guyman', 'Midland', 'Midland 99', 'Russell', 'Tifton 44', 'Quick Start', and, one experimental line, '74X12-6' from Oklahoma State University. The study will be expanded as other entries become available. The results of this study will be published in "Technical Notes", and reported to the members of the Cattleman's Association.

Fruit and Nut Tree Production on Reclaimed Coal Mined Land: Coal strip (surface) mining in the 1930s which was reclaimed in the mid 1980s has resulted in large unproductive areas. Since these are "pre-law" mines, there was no topsoil stockpiled for use during reclamation. Fruit and nut tree production is being evaluated on land that was basically characterized as low production. The study consists of four varieties each

of apple, peach, pecan, and walnut. The trees were planted in 1994, and have recorded excellent growth. Drip irrigation is used, and the orchard is mowed twice per year. The apple and peach trees are in full production with only moderate pecan production and slight walnut yield. Diameter at Breast Height (DBH) is recorded annually in the fall. This study will be concluded in 2006. A Technical Note will be developed.

Arkansas Highway and Transportation Department:

The Booneville Plant Materials Center was awarded its second contract by the Arkansas Highway and Transportation Department in September 2001 (TRC-0205). The PMC has five active studies throughout the state of Arkansas that are designed to address erosion on both new highway construction and existing highway rehabilitation. These studies test various annual and perennial native species, a variety of seedbed preparation techniques, various mulches and mulch application methods; also new product tests such as Envirogard and Envirogard Plus. The products of this effort will be revised vegetative establishment specifications and rehabilitation specifications for AHTD, as well as technical notes that will benefit others who need to establish vegetation on critical areas, such as abandoned surface mines, gas well drilling sites, county roads, and logging roads.

AHTD Mountainburg I: The Mountainburg site was designed to identify species, and seedbed preparation techniques. The six species that were used were; big bluestem; little bluestem, eastern gamagrass, indiangrass, switchgrass, and maximillian sunflower. The seedbed treatments were tilled/planted, tilled/planted/rolled, no-till/planted, and no-till planted/rolled. Switchgrass was identified in all replications and treatments as most successful, then indiangrass, big bluestem, eastern gamagrass, sunflower, and little bluestem. The final report of TRC-9802 has been completed and delivered to AHTD.

AHTD Greenwood: This study is on State Highway 71. It is a rehabilitation study. The 2:1 slope eliminates the use of motorized equipment. The slope had three-foot gullies. The Center staff established several hundred plants in cones, and transplanted them on the slope across the gullies in varying widths and thicknesses. We are monitoring silt below each treatment annually. The results of this study can be found in the TRC-9802 final report.

AHTD Magazine: This is another rehabilitation site. We are testing vegetative hedges across 3:1 slopes at various angles, widths, and thicknesses to assess their effectiveness in stabilizing rill erosion. The results have been reported to the AHDT.

AHTD Mountainburg II & III: Second and third studies near Mountainburg were established in 2002. These studies were designed to compare mulch materials applied on a 3:1 slope. The materials used were annual small grain straw, grass hay, jute blanket and Envirogard Plus (composted animal waste and recycled paper). The plant material used was ‘Blackwell’ switchgrass. Data collection consists of erosion control, germination, stand, and seedling survival and vigor. This study is the first in a series to be carried out by the Booneville PMC for the AHTD. The contract was for 48 months and began in January 2002. The draft final report of TRC-0205 was completed in September. 2005.

Demonstrations/Field Planting Summary

The Plant Materials Center maintains eight demonstration sites. A two-acre plot of 'Pete' eastern gamagrass was established for demonstration on the Center in 1997. A four-acre plot of 'Pete' was established for the Idabel Oklahoma Conservation District on their Demonstration Farm in 1999. 'Pete' was established for demonstration at Elm Park in Altus, Arkansas in 2000. Native grasses 'Pete' eastern gamagrass, 'Alamo' switchgrass, 'Kaw' big bluestem, and 'Lometa' indiangrass were established on the University of Arkansas at Pine Bluff research farm near Lonoke, Arkansas in 1999. 'Alamo' switchgrass was established to demonstrate erosion control on a sand fill in Morrilton, Arkansas for the Arkansas Power Corporation in 1998. 'Alamo' has also been planted for demonstration in Altus, Arkansas and on Center in 2003. The off center plots are managed by the cooperator and evaluated by the District Conservationist in that county. The PMC staff makes annual visits to each site. A native grasses demo plot was planted for the USFS near Cass, Arkansas on the Mulberry River in the spring of 2005.

Special events at the PMC:

On February 23-25th the PMC was host to the National Plant Materials Advisory Committee Meeting.

On February 17th the Center was host to 865 high school FFA students. This FFA Field Day is a practice for the State Judging contest.

The PMC was host to Arkansas' version of 'Boot Camp'. This camp was for new NRCS employees. The Boot Camp was a three week course.

The Center also hosted an Arkansas State Plant Materials Committee Meeting, a PM Technical Meeting, and a State Conservationists Advisory Meeting during 2005.