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Natural Resources
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2005 ANNUAL TECHNICAL REPORT

JIMMY CARTER
PLANT MATERIALS CENTER

SILVOPASTURE STUDY IN EARLY CO GEORGIA
(Landowner, Georgia State Conservationist, Blakely DC)

A Technical Summary of Plant Materials Studies
At the Jimmy Carter Plant Materials Center
Americus, Georgia

NRCS Natural Resources Conservation Service

STATE CONSERVATIONIST

James E. Tillman, Sr.

NAT'L PLANT MATERIALS SPECIALIST

Robert Escheman

PLANT MATERIALS SPECIALIST/TEAM LEADER

Donald Surrency

PLANT MATERIALS CENTER STAFF

Charles M. Owsley	Manager
Malcome S. Kirkland	Asst. Manager
Vacant	Biol. Technician
Larry L. Vansant	Biol. Technician

STATE CONSERVATIONISTS ADVISORY COMMITTEE

Purpose: The purpose of the committee is to provide leadership in the coordination, communication, support, and integration of applied plant science technology within and between states, the Regional and National Plant Materials Advisory Committees and other partners.

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Walter W. Douglas	Columbia, SC
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Mary K. Combs	Raleigh, NC
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The Plant Materials Technical Committee provides input to the PM Advisory process. The PM Technical Committee may be on a state, multi-state or other regional/local level for a single PMC or for multiple Plant Materials Centers. Responsibilities include:

- Provides overall technical leadership in the identification, integration, and prioritization of plant technology needs.
- Develops recommendations for addressing needs and submits information to the State Conservationist's Plant Materials Advisory Committee for review and approval.
- Promotes the transfer of developed applied science technology.

Technical Committee Members

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Robert Escheman, NPL-NRCS	Washington DC
Josh Wheat, SRC NRCS	Athens, Ga
Bill Hughes, SRC, NRCS	Auburn Ala
Ronnie Feaster, SRC, NRCS	Columbia SC
Donald Surrency, PMS, NRCS	Athens Ga
Mimi Williams, PMS, NRCS	Gainesville Fla
Vic Simpson, SRC, NRCS	Nashville, Tenn.
Dr Jorge Mosjidis, Res, Auburn Univ	Auburn Ala
Dr Mary Miller-Goodman, Res, Auburn Univ	Auburn Ala
Dr Edzard VanSanten, Res, Auburn Univ	Auburn Ala
Dr Mark Latimore, Res, FVSU	Fort Valley GA
Dr Glenwood Hill, Res-Farmer	Fort Valley Ga
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Tom Wilburn, EPA	Atlanta Ga
Merrill Varn, Okefenokee Growers	Folkston Ga
Dr Errol Rhoden, Res, Tuskegee UNiv	Tuskegee Ala
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Dr David Kissel, Res, Univ Ga	Athens, Ga
Larry Dyck,,Res, Clemson Univ	Clemson SC
Neal Leonard, FVSU Liaison, USDA	Fort Valley Ga
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Ed McDowell, GA Native Plant Soc	Atlanta Ga
Dennis Law, USFS	Columbia SC
David Bennett, GA S&W Con Comm	Athens Ga
Tom Aiken, District Supervisor, Lamar Co GA	Barnesville Ga
Dot Harris, ASTC-Tech, NRCS	Athens Ga
Ed Hackett, Wildlife Biologist, Wildlife Inst NRCS	Madison Miss
Mike Owsley, Mgr., JCPMC, NRCS	Americus Ga
Malcome Kirkland, AMGR, JCPMC, NRCS	Americus Ga
George Coleman, HoneyHole Nursery	Glenwood Ga
Robert Simmons, Georgia DNR	Social Circle, Ga
Eddie Jolley, Agronomist, NRCS	Auburn, Al
Brent Dykes, GA S&W Con Comm	Athens, Ga
Kenny May, Sunbelt Genetics	Troy, Al
Wayne Vassar, Sharp Bros. Seed Company	Clinton, Mo
Marc Thomas, Georgia Forestry Commission	Macon, Ga

TABLE of CONTENTS

INTRODUCTION

The Jimmy Carter Plant Materials Center (PMC) is part of a national plant materials program operated by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), formerly recognized as the Soil Conservation Service (SCS). The purpose of the PMC is: to assemble, evaluate, and release new plant materials for conservation use; to determine techniques for their successful use; to provide for their commercial increase; and to promote the use of plant materials needed to meet the objectives of the National Conservation Program.

The Plant Materials Center serves NRCS field offices, public agencies, commercial seed and plant producers, and the general public in Georgia, Alabama, South Carolina, North Carolina, and parts of Florida and Tennessee. These states present a wide range of climatic and soil conditions and include a total of 13 major land resource areas (MLRAs) representing 120,377,913 acres across the Southeastern United States.

PMC activities are guided by a five-year program focusing on the development of the following high priority items for **Farm Bill Implementation**:

I. Evaluation of native grasses for grazing lands that support sustainable agriculture. (Conservation buffers, forage, erosion control, wildlife habitat improvement, urban landscapes, 2005 Farm Bill Implementation)

II. Evaluation of native plants for water quality (riparian forest areas, conservation buffers, filter strips, constructed wetlands, and streambank stabilization, 2002 Farm Bill Implementation).

III. Evaluation of plants for conservation tillage (green manure, organic gardening, carbon sequestration and winter cover)

LOCATION AND FACILITIES

The PMC is located on the northwest corner of Americus, Georgia approximately 40 miles north of Albany, Georgia. The facility consists of 327 acres of land with 19 buildings, including a new office building (conference room), greenhouse, seed cleaning /seed storage facilities, pesticide storage, and an underground irrigation system that covers approximately 85 acres. The center's land includes seven soil types, with Orangeburg predominating. Approximately two-thirds of the acreage is open for cultivation, and Muckalee Creek runs through the southwest corner.

HISTORY

The PMC was established in 1936 to produce planting material, mainly pine seedlings for use by the Civilian Conservation Corps (CCC) and for former SCS demonstration projects. The site was originally rented, but was purchased by the federal government in 1942. The center was operated on contract by the University of Georgia Experiment Station from 1954 to 1975, was SCS-operated from 1976 to 1994, and is currently NRCS-operated. Historically, the PMC's objective has been to find erosion-minimizing plants. Today the center seeks to solve problems confronting soil, water, air, plants, and animals.

PARTNERSHIPS

The PMC has conducted cooperative programs with the following organizations:

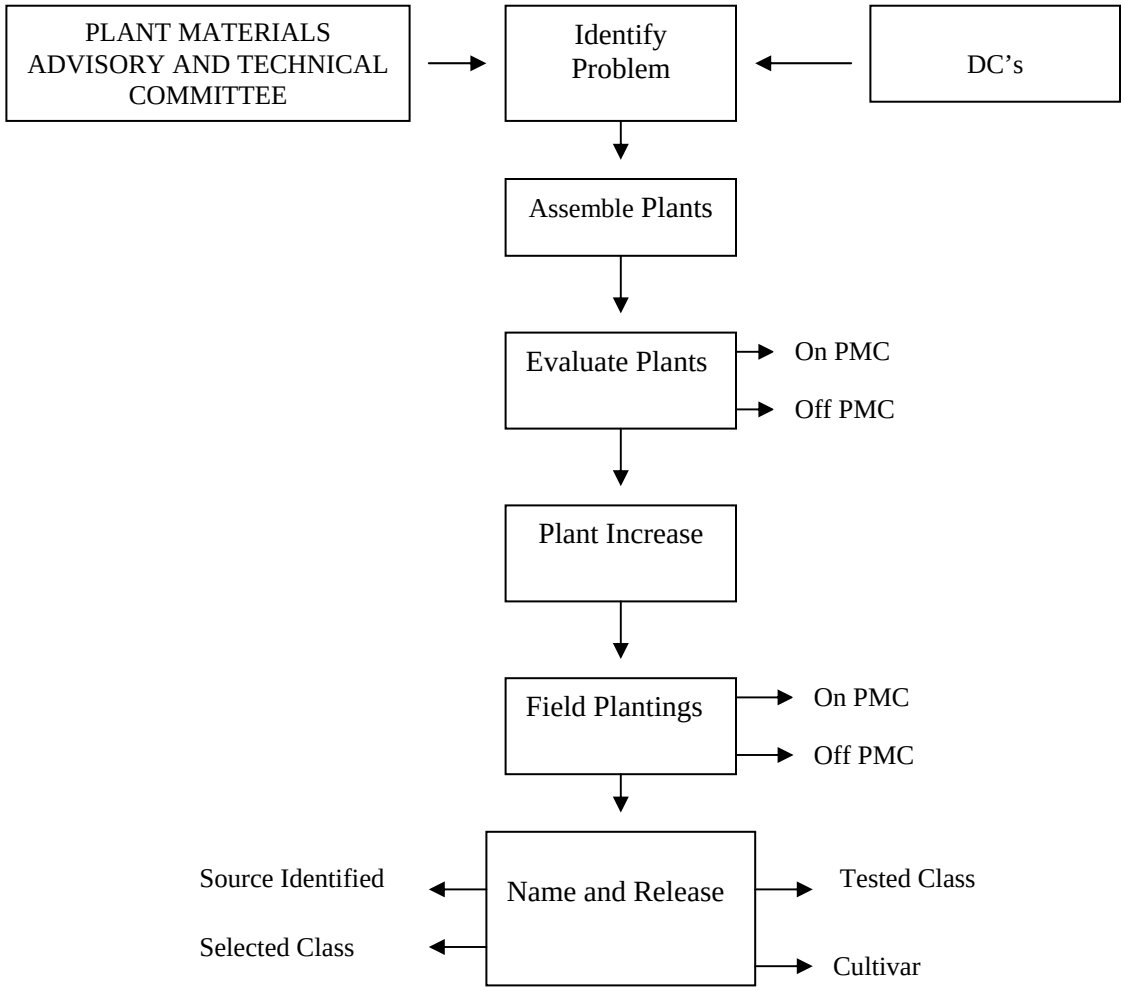
Alabama Agricultural Experiment Stations
Alabama Crop Improvement Association
Fort Valley State University
Georgia Crop Improvement Association
Alabama S&W Conservation Commission
Clemson University
Quail Unlimited
Alabama A&M University
Auburn University
Georgia Forestry Commission
Georgia Department of Transportation
RC & D Councils
North Carolina A&T University

PARTNERSHIPS (CONTINUED)

Georgia Seed Development Commission	Georgia Agricultural Experiment Stations
Jekyll Island Authority	Georgia Department of Natural Resources
The University of Georgia	Tuskegee University
United States Environmental Protection Agency	United States Army Corps of Engineers
United States Department of Energy	United States Forest Service
United States Fish & Wildlife Service	Georgia Soil & Water Conservation Comm.
United States Department of Defense	Lamar Co. S&WCD
United States Department of Agriculture (ARS)	Flint River S&WCD
Lower Chattahoochee S&WCD	Alabama Forest Commission
Georgia Association of Conservation Districts	Alabama Association of Conservation Districts

PLANT MATERIALS PROGRAM

The Plant Materials Program has established a **systematic process to evaluate and release plants** to address the conservation problems outlined in the long-range program. The intensity and time of evaluation will vary according to the class of release. A cultivar will require many years of intense evaluation whereas a source identified plant can be released in 1-2 years with little evaluation. The following flow chart illustrates the steps involved in this process:



In addition to the release of new plants, the **PMC develops new technology to better utilize plant materials for our high priority concerns.**

DESCRIPTION OF THE SERVICE AREA

The Jimmy Carter PMC serves Alabama, Georgia, South Carolina, North Carolina, and parts of Tennessee and Florida. These states present a wide range of climatic and soil conditions.

Elevations range from sea level to over 6,000 feet. Low temperatures will vary from -20 degrees F at the higher elevations to 10 degrees F along the coast while summer high temperatures range from 70 F in the mountains to 110 F at lower elevations.

Frost-free days vary from 260 days near the coast to 130 days at the higher elevations.

Annual rainfall over the area ranges from 45 to 80 inches.

The states served by the center are represented by the eleven major land resource areas.

MAJOR LAND RESOURCE AREAS SERVED

123	Nashville Basin
128	Southern Appalachian Ridges and Valleys
129	Sand Mountain
130	Blue Ridge
133A	Southern Coastal Plain
134	Southern Mississippi Valley Silty Uplands
135	Alabama and Mississippi Blackland Prairies
136	Southern Piedmont
137	Carolina and Georgia Sandhill
152	Gulf Coast Flatwoods
153	Atlantic Coast Flatwoods

Soil Conditions vary widely -- deep droughty sand, heavy plastic clay subject to excessive intermittent wetness and drying, highly acid to alkaline extremes, and swamps and marshes - fresh and salt. Farming enterprises also vary widely. The area contains a number of heavily populated suburban areas surrounding centers of industry and commerce. The mountains, seashore, and other areas of natural beauty are being rapidly developed to meet the demand for recreation.
Such diversity of climate, soil, and enterprises requires many different types and kinds of vegetation to provide for protecting the land when it is properly treated for soil and water conservation.

Summary of Weather Conditions- Jimmy Carter PMC-2005

1929-2005

	TEMPERATURE (°F)		PRECIPITATION (Inches)			
Month	**2005 Mean Max**	**2005 Mean Min**	**Month Total 2005**	**76 Year Average**	**76 Year High Month**	**76 Year Low Month**
January	61	38	2.94	4.33	11.19	.64
February	62	40	3.61	4.57	12.28	.56
March	66	39	9.43	5.33	12.11	.28
April	73	48	4.48	3.79	12.26	.00
May	82	56	2.57	3.27	8.35	.14
June	85	67	8.26	4.38	11.69	.03
July	90	71	10.56	5.27	24.79	1.25
August	86	71	8.15	4.06	11.76	.99
Sept	88	67	.82	3.54	14.00	.10
October	78	54	.25	2.05	9.60	.00
Nov	72	45	4.08	3.02	10.63	.05
Dec	58	35	4.13	4.10	12.29	.42
Total	-	-	59.28	47.71		

INTRODUCTION:

Big bluestem (*Andropogon gerardi*) is a perennial, warm season grass. It is cross-pollinated and has several ploidy levels X = 20, 40, 60. Big bluestem is photoperiod sensitive. It is widely distributed in the United States. It occurs in tall grass prairies of the Midwest as well as in forested areas of the southeast. It also has potential for other conservation concerns, such as, wildlife habitat improvement (WHIP), farm bill implementation, erosion control, and warm season native forages. It has been utilized for forage and hay production. This study attempts to evaluate big bluestem ecotypes for cultivar development for the Southeast.

MATERIALS AND METHODS:

In 1989-1990, the PMC assembled 750 vegetative ecotypes of southeastern big bluestems. These ecotypes were placed into an initial evaluation block. Each entry was planted to ten-foot rows with one foot between clones. All entries were separated by three-foot middles. Each entry was replicated twice.

RESULTS AND DISCUSSION:

In 1990 and 1991, the evaluation process began. The following were the evaluation criteria: 1) vigor, 2) stem color, 3) inflorescence color, 4) foliage amount, 5) foliage height (cm), 6) foliage color, 7) forage potential, 8) disease/insect resistance, 9) boot date, bloom date, maturing date, and percent germ, 10) seed amount, 11) uniformity, 12) leaves height on stem, 13) total height, 14) stem size, 15) tillering, 16) steminess, 17) basal foliage, 18) lodging, 19) late maturity.

In spring 1992, Dr. Edzard van Santen of Auburn University began a cooperative big bluestem study with the Jimmy Carter PMC. The following criteria were added to the existing evaluation process: 1) percent stand, 2) forage mass, 3) greening up date, 4) biomass at flowering (green weight and dry weight), 5) surface area of plot, 6) morphological data, and 7) % ADF of stem.

In June 1993, four pairs of cow/calf units were allowed to graze the big bluestem area. Cattle were removed and Dr. van Santen evaluated the cattle's preference for specific ecotypes. After regrowth, cattle were again allowed to graze the vegetation down to 8-inch stubble residues.

Dr. van Santen's data was processed and determined which ecotypes were selected for 'biomass type' crossing blocks in 1994. These blocks should produce germplasm for comparison testing against a standard big bluestem cultivar. The three blocks consist of early maturing ecotypes, late maturing ecotypes and median maturing ecotypes.
Early maturing crossing block
Lines - 23, 52, 54, 62, 71, 78, 81, 84, 94, 97, 140, 142, 161, 231, 260, 305, 322, 336, 351, 368, 481, 484, 542, 561, 578, 595, 624, 661, 676, 704,719
Median maturing crossing block
Lines - 1, 7, 10, 18, 20, 38, 44, 57, 61, 69, 75, 77, 85, 88, 89, 91, 93, 111, 116, 159, 200, 204, 223, 373, 432, 438, 452, 496, 497, 513, 532, 560, 580, 592, 598, 627, 689, 691, 709, 738
Late maturing crossing block
Lines - 4, 14, 32, 42, 46, 48, 50, 58, 59, 66, 73, 76, 98, 99, 106, 107, 122, 123, 124, 126, 127, 130, 131, 134, 143, 366, 399, 406, 692

Each line was represented by three replications per crossing block to ensure proper pollination.

In 1995, seed was collected from the three-biomass crossing blocks. All seed collected expressed high dormancy characteristics. Dr. van Santen is currently working to resolve this seed dormancy problem.

In March 1998, Dr. van Santen determined which ecotypes should constitute crossing blocks for production of big bluestem 'forage type' germplasm. The crossing blocks consist of early maturing ecotypes, median maturing ecotypes and late maturing ecotypes. Each line was replicated three times per crossing block to ensure proper pollination.

Early maturing crossing block
Lines - 15, 84, 105, 110, 135, 136, 140, 154, 166, 179, 198, 215, 216, 218, 245, 247, 260, 290, 297, 361, 364, 385, 389, 397, 436, 439, 455, 484, 488, 500, 548, 561, 568, 641, 661, 693, 707, 743.

Median maturing crossing block
Lines - 7, 17, 18, 26, 77, 114, 155, 181, 200, 214, 228, 234, 252, 266, 296, 328, 334, 377, 414, 420, 446, 447, 472, 482, 505, 510, 520, 524, 537, 559, 569, 584, 649, 651, 689, 700, 717, 725.

Late maturing crossing block
Lines - 3, 4, 14, 42, 46, 49, 59, 60, 66, 90, 98, 122, 124, 126, 131, 144, 170, 206, 219, 249, 254, 261, 298, 312, 325, 333, 341, 362, 366, 406, 426, 540, 575, 635, 658, 678, 679, 747.

In 2004 late maturing seed was collected and tested for germination and seedling vigor. Results indicate very little seed fill and germination. Therefore in 2005 the PMC altered the cultural techniques used on the big bluestem fields. Fields were burned during growing season instead of dormant season to stimulate inflorescence production and sprayed in summer with insecticide to prevent possible insect (midges) infestation of the seed heads. Seed was harvested in October 25,2005. This seed will be planted in 2006 for seed increase.

Subsequent seed harvest will be used for increase and comparative replicated forage testing .

Big Bluestem Crossing Block Burn May 26,2005

Big Bluestem Crossing Block at Native Grass Conference for Small Farmers (September 2005)

PROJECT 13A140S - EVALUATION AND SELECTION OF PLANT MATERIALS FOR FOREST BUFFERS IN THE SOUTHEASTERN UNITED STATES

INTRODUCTION:

This test consists of the following species: ogeche lime, red maple, blackgum, green ash, cherry bark oak, loblolly pine, yellow poplar, bald cypress, water oak, sweetgum, white oak, and sycamore. The goal of the project is to determine which tree buffer produces optimal growth and uptakes the most applied fertilizers.

MATERIALS AND METHODS:

Plantings were established by use of dibbles in the winter of 1993/1994. One 54 foot x 100 foot block per species was planted on 6 foot spacings. Each block runs perpendicular to the slope, and was planted with 160 trees.

RESULTS AND DISCUSSION:

Information contained in Tables 1-2 provides vegetative data to accompany future chemical analysis. All growth means represent means of surviving material. Through 2001 sweetgum, green ash and cherrybark oak produced the most height growth. Through 2004 ogeche lime has the greatest trunk diameter growth. However, it also has a low percent survival reading. Through 2004 the highest survival means were recorded by green ash and cherrybark oak. Due to a shortage in PMC personnel this project was not evaluated in 2005.

In June 1998 and June 1999, the PMC staff in cooperation with Dr. Richard Lowrance of ARS (Tifton, Ga.) took soil, stem, leaf, and fruit samples from selected specimens in the tree blocks. These were analyzed for N & P content. PMC staff fertilized the blocks in May 1999 (158 lbs N/Ac and 30 lbs P/Ac). Dr. Lowrance is evaluating and analyzing the N & P data for future reports. If funds become available further analysis and cooperation with the USDA-ARS should determine which block of trees has the highest capacity for fertilizer uptake.

TABLE 1 MEAN % SURVIVAL OF FOREST BUFFER TREES

Tree Species	Aug 1995	Aug 1996	Sep 1997	Jul 1998	Aug 1999	Oct 2000	Aug 2001	Aug 2002	Sep 2003	Sep 2004
Loblolly Pine *	16	13	13	13	13	12	12	12	12	12
Yellow Poplar *	14	8	8	8	8	7	7	7	7	7
Sycamore *	27	20	20	20	20	20	20	20	18	16
Blackgum	68	66	63	63	62	62	62	62	62	62
Cherrybark Oak	89	89	89	88	87	87	87	87	87	87
Sweetgum	77	73	74	74	74	74	71	70	70	70
White Oak	49	46	44	44	43	43	43	43	43	43
Bald Cypress	71	70	68	68	68	66	66	66	66	66
Green Ash	81	82	82	82	82	81	81	81	81	81
Red Maple	76	71	72	71	71	71	68	67	67	67
Ogeche Lime	35	35	34	35	35	35	34	34	33	33
Water Oak	73	70	70	70	70	70	70	70	70	70

* Low survival trees were not included in further data tables

Forest Buffer Evaluation Area at Jimmy Carter PMC

Bald Cypress (Previous Page) White Oak (Above)

TABLE 2 TRUNK DIAMETER OF FOREST BUFFER TREES

Mean Diameter Main Trunk Ground Level (mm)

Tree Species	Aug 1994	Aug 1995	Jul 1996	Sep 19 97	Jul 19 98	Aug 1999	Oct 2000	Aug 2001	Aug 2002	Sep 2003	Sep 2004
Blackgum	7.232	14.4	26.6	35.2	54.4	84.5	88.9	109.3	112.5	127.5	138.1
Cherrybark Oak	5.61	12.1	28.0	46.0	63.6	96.5	122.4	151.1	152.5	170.6	174.4
Sweetgum	10.54	24.5	42.3	65.5	88.9	116.1	134.6	172.8	186.7	225.8	229.2
White Oak	6.73	11.0	19.4	24.5	35.6	52.1	63.6	95.6	109.4	138.8	145.2
Bald Cypress	8.06	18.0	31.0	43.7	63.2	76.5	105.0	114.6	127.8	151.3	156.9
Green Ash	25.49	46.4	69.7	82.7	107.8	1l5.9	119.0	122.2	135.6	160.6	162.5
Red Maple	8.19	20.7	43.0	56.0	76.9	90.6	110.1	125.9	151.4	178.8	185.5
Ogeche Lime	16.57	35.6	64.3	110.5	126.6	149.7	162.2	210.5	258.1	289.6	292.3
Water Oak	9.23	21.7	30.9	49.9	66.2	86.9	96.8	118.2	143.5	158.8	164.4

PROJECT 13A142R - GRAZING MANAGEMENT OF EASTERN GAMAGRASS

INTRODUCTION:

Eastern gamagrass, *Tripsacum dactyloides*, is a warm-season, native, perennial grass suited to most of the Eastern United States. One of its potential uses is forage for livestock. The Jimmy Carter Plant Materials Center in Americus, Georgia is demonstrating intensive grazing management of this plant. The Lamar County Soil and Water Conservation District is cooperating by providing cattle for the demonstration. The uses of eastern gamagrass are grazing land, wildlife habitat improvement, critical area stabilization, biofuels, alternative fuels, streambank stabilization, nutrient reclamation/uptake, filter strip, conservation buffers, and urban conservation.

MATERIALS AND METHODS:

In the spring of 1993, a 4.5 acre field of Eastern gamagrass, (variety 'Pete'), was planted in 36 inch rows using a corn planter. This 4.5-acre pasture was allowed to establish through 1994 and into 1995.

This demonstration is located on the northwest side of the town of Americus, Georgia, where mean annual precipitation is 125 cm (about 49"), and the mean annual temperature is 18.5 degrees Celsius (about 65.3 degrees Fahrenheit).

The demonstration site is divided into ten paddocks, approximately 0.2 hectares (about 0.45 acre) each, using a single strand of electric fence wire about 90 cm high. Water is provided to each paddock using one inch black plastic pipe and 60 gallon portable water trough. The water source is Muckalee Creek.

In April 2004 the Lamar County Soil and Water Conservation District provided ten heifers. Each heifer weighed about 658 pounds prior to grazing.

The heifers were weighed, vaccinated, wormed, dusted, and ear tagged.

May 17, 2004 the heifers were moved into the first eastern gamagrass paddock to begin a 2.5-3.5 day grazing period in each paddock.

In the spring, 600 pounds per acre of 10-10-10 fertilizer was applied to the pasture, then approximately 150 pounds of ammonium nitrate was applied to each paddock after each grazing event.

In previous years manure samples were taken on a periodic basis to determine crude protein and digestible organic matter of the eastern gamagrass consumed by the animals. The Grazing Animal Nutrition Laboratory at Texas A&M University was utilized to determine these readings. The NUTBAL Nutritional Balancer software was used to predict animal nutritional needs.

RESULTS AND DISCUSSION:

Cattle were rotated successively through the ten paddocks with 2.5-3.5 days grazing period in each paddock for four cycles. Eight to ten inches of plant stubble was left after each grazing event. The cattle were rotated through the entire ten paddocks until October 6, 2004.

The results from typical manure samples taken from the heifers are as follows:
Crude Protein ranged from 11.8 to 14.14%. Digestible organic matter ranged from 63.68 to 66.49 %.

AVERAGE WEIGHTS 2004

	DATE	WEIGHT	TOTAL GAIN	AVG. DAILY GAIN
Beginning	May 17	658 lbs	-	-
Ending	OCT 06	732 lbs	74 lbs	0.44 lbs

In 2001-2003 heifers have shown an average daily weight gain (ADG) of approximately 1.0 after grazing the eastern gamagrass at the Jimmy Carter Plant Materials Center in Americus, Georgia. In 2004 heifers were less inclined to consume forage compared to previous herds and only produced an ADG of .44lbs. similar procedures with steers in 1999 and 2000 produced an average daily gain of 1.75 and 1.5 respectively. Due to increased workload on other projects the eastern gamagrass pasture was rested for regeneration in 2005.

Observations and results of NIRS analysis of fecal samples for crude protein suggest that forage quality is adequate for typical livestock operations in this region.

After each grazing period cattle were moved to a new paddock

EASTERN GAMAGRASS ROTATIONAL GRAZING STUDY

Lamar Co S&WCD cattle grazing paddocks

PROJECT 13A144R - GRAZING MANAGEMENT OF YELLOW INDIANGRASS (*SORGHASTRUM NUTANS*)

INTRODUCTION:

Yellow indiangrass (*Sorghastrum nutans*) is a native perennial warm season grass. It can be utilized for forage and hay production. This test attempts to demonstrate the use of a PMC selection known as PI-514673. Emphasis will be placed upon establishment and management techniques for forage production for the Southeast.

MATERIALS AND METHODS:

In the fall of 1993, a three-acre bahia grass pasture was sprayed with Roundup. In February 1994, the pasture was disked. In March 1994, 450#/Ac of 0-14-14 fertilizer was applied. On May 5, 1994 the pasture area was disked and cultipacked to firm the seedbed. Indiangrass seed was applied with a Solo fertilizer spreader set on No. 24 for a 12-14 foot swath. The rate of seeding was 25 #/Ac or 10# pls/Ac. The area was then cultipacked perpendicular to original cultipacking for proper seed covering. In June 1994, broadleaf weeds were sprayed with 2-4-D at a rate of 1 qt/Ac. A good stand of indiangrass was observed during the summers of 1995 - 1996.

In May 1997, 10-10-10 fertilizer was applied at the rate of 600 #/Ac. The first week of June, 150 #/Ac of ammonium nitrate were spread on the area. On May 27, 2, 4-D herbicide was sprayed at 1 qt/Ac to control broadleaf weeds. Similar cultural practices were followed thereafter.

RESULTS AND DISCUSSION:

In 2000, 12 steers from Lamar Co. S&WCD strip grazed the indiangrass field from late June until early July. Cattle quickly adapted to the new source of forage. Fecal samples from this grazing episode indicated plant crude protein of 7.64 - 10.03 % and digestible organic matter of 64.14 - 67.60

In October 2005, Americus indiangrass seed was harvested from the indiangrass field.

Additional rotational grazing of the indiangrass is planned for future years when needed to supplement other grazing studies such as the silvopasture study.

'Americus' Indiangrass Field - Growth of 6-8 inches on April 15,2005 2 Weeks After Burn

PROJECT 13A148R - GRAZING MANAGEMENT OF SWITCHGRASS (*PANICUM VIRGATUM*)

INTRODUCTION:

Switchgrass is a native perennial warm season grass. It can be utilized for forage and hay production. This test attempts to demonstrate the use of 'Alamo' switchgrass. Emphasis will be placed upon establishment and management techniques for forage production demonstration.

MATERIALS AND METHODS:

May 1995, a six-acre field was bottom plowed and disked. In June 1995, the field was leveled with a field cultivator. The field was fertilized with 30 #/Ac of phosphorus and potassium. Switchgrass seed was applied to the cultipacked field, using a fertilizer spreader. Seeding rate was approximately 10 pounds pls/Ac. After seeding, the field was cultipacked perpendicular to the first cultipacking. Depth of seed was approximately 1/4 inch. A dry period delayed germination, however, a good stand was observed by the fall of 1995. Pigweed was controlled with one qt/Ac of 2, 4-D.

The field is divided by electric wire into ten separate paddocks with accompanying water tanks.

600 lbs. /Ac of 10-10-10 fertilizer were applied to the Alamo field in spring 2000.

On May 25 2000, ten Brangus heifers from Fort Valley State University (Dr. Glenwood Hill) arrived for the switchgrass demonstration. The animals were wormed, vaccinated, and dusted by personnel of Fort Valley State University.

RESULTS AND DISCUSSION:

The heifers began grazing on June 5, 2000. They were rotated through the ten-paddock system on a five-day grazing period per paddock. Approximately 8 -10 inches of plant stubble was left after each grazing event. They grazed through two complete cycles and produced an average daily gain of .7 pounds. This was down from 1 pound of ADG in 1999. This reduction is attributed to severe drought experienced in 2000.

Results from manure samples (forage quality) and weights from the heifers are as follows:

DATE	% CRUDE PROTEIN	% DIGESTIBLE ORGANIC MATTER
June 12	9.65	65.11
June 13	9.65	65.63
June 22	12.53	65.25
June 28	10.44	63.92
July 21	13.39	68.08

WEIGHTS

	DATE	AVERAGE WEIGHT	TOTAL GAIN	AVERAGE DAILY GAIN
Beginning	Jun 5	664 lbs	-	-
Ending	Aug 23	726.67 lbs	62.67 lbs	.7 lbs/day

Cattle selectively grazed leaves and attempted to avoid the stemy growth of the Alamo. Forage quality data and weight gain seems to indicate 'Alamo' can sustain heifers under a rotational grazing system.

The "Alamo" switchgrass field is being maintained for possible use by cattle in the silvopasture study.

PROJECT 13A150R - QUANTITATIVE AND QUALITATIVE RESPONSE OF NATIVE GRASSES VERSUS INTRODUCED WARM SEASON PASTURE PLANTS AS INFLUENCED BY DIFFERENT BURN REGIMES

INTRODUCTION:
Very little comparative testing between native and introduced warm season forage plants has been documented in the Southeastern United States. This test attempts to establish, evaluate, and analyze different warm season pasture plants and mixtures subjected to different burn regimes. Data should provide qualitative and quantitative information relative to native and introduced pasture species performance in different burn management regimes. Response variables include species composition, and species frequency. This is a cooperative effort between the NRCS and Dr. Mary S. Goodman of Auburn University.

MATERIALS AND METHODS:

On May 6, 1997, the following experimental split plot design was established:
Split plot (cultivars) with main plots (burn regime) in RBD with three (3) reps. Main plots (50' x 300') are burn #1 and burn #2. Split plots (50' x 50') are six cultivar and cultivar mixes. (1) pure 'Cave-In-Rock' switchgrass (2) pure 'Earl' big bluestem , (3) pure 'coastal' bermudagrass, (4) pure 'Pensacola' bahiagrass, (5) a mixture of 30% little bluestem, 25% big bluestem, 20% 'Americus' indiangrass, and 25% switchgrass, (6) a mixture of 50% little bluestem and 50% 'Serala' lespedeza. Grass seeds were planted at a rate of 10 # PLS/Acre and coastal bermuda was planted at a rate of .15 Bu/120 sq. ft. Serala lespedeza was seeded at 20 #/Acre.

RESULTS AND DISCUSSION:

In 1998 all plots were burned. Since 1999, burn #1 plots were burned every year and burn #2 plots burned every two years. In 1998 - 2002, percent species composition was recorded for each plot. In 1999- 2002, species frequency was recorded for each plot. Dr. Mary S.Goodman conducted analysis of percent species composition and species frequency. The following is an abstract from a poster based on this study presented by Dr Goodman and the PMC at the Second National Conference on Grazing Lands held in Nashville Tennessee December 7-10 2003.
Accumulation of desirable canopy cover is necessary during pasture establishment to protect pasture soil and provide optimum forage quantity and quality. The objective of this study was to evaluate long-term responses of desirable and invasive cover components of forage swards to burn frequency during pasture establishment in a humid, southeastern environment. Forages were sown or sprigged spring 1997 at Americus Ga. in 6 blocks of six 50 by 50 foot plots that included (a) little bluestem +big bluestem +switchgrass +indiangrass (b) little bluestem +serecia lespedeza (c) bahiagrass (d) bermudagrass (e) big bluestem (f) switchgrass. All blocks were burned spring 1998; thereafter, one-half of the blocks were burned every, and one-half every-other year. Percent canopy cover was estimated each fall (1998-2002) and analyzed as a split plot design with year after establishment the main plots; burn frequency the subplots. Percentages of 70-yr average rainfall (48in) for 1997 to 2002 were 117, 92,60, 77, 100, 98, respectively. Burn frequency had significant and varying impacts on cover of specific desirable and invasive species and these impacts often occurred in interaction with impacts of year after establishment and mixture. For example, little bluestem cover in first mix was not different in year 1 (13%) versus year 5 (17%) after establishment if the mix was burned every year. However, when burned every other year, little bluestem cover in first mix was higher (P=. 016) in year 5 (38%) versus year 1 (16%). In second mix little bluestem cover was higher (P=.010) after year 5 when burned every year (32%) versus every other year (16%). Also bahia as an invasive was reduced after year 5 compared to year 1 in some cases. During pasture establishment, desirable and invasive cover components responded positively and negatively to burn frequency over time and these responses varied within a species when sown in different mixtures.

Growing season burn conducted May 26, 2005

Transect and Quadrate Data collection from burn plots

The burning regime for the study was changed in 2004 from a **cool season burn** to a **growing season burn.** May 25, 2004 all plots were burned. On May 26,2005 the main plots which burn every year were burned while the main plots that burn every three years were not burned.. November 2005 percent species composition and species frequency were recorded from all plots. This data (means from 3 reps) will be analyzed in an ANOVA at a future date. The following data was taken from the plots in 2005:

BB= Big Bluestem LB= Little Bluestem SW= Switchgrass IN = Indiangrass LE= Sericea Lespedeza BE= Bermudagrass BA = Bahiagrass RU=Rubus sp. WE= Weed OP=Open 4-Mix= Big Bluestem+ Little Bluestem+ Switchgrass + Indiangrass

2005 DATA (MEANS)

SPRING BURN EVERY YEAR - ***% SPECIES COMPOSITION***

PLOT	BB	LB	SW	IN	LE	BE	BA	RU	WE	OP
BB	75.9	0	0	0	0	0	12.3	5.1	1.4	5.1
LB+LE	0	14.5	0	0	25.2	0	25.8	19.7	13.6	.9
BE	0	0	0	0	0	18.8	57.5	16.1	6.0	1.4
SW	0	0	4.2	0	0	0	46.5	36.4	9.4	3.3
BA	0	0	0	0	0	0	76.2	18.4	4.7	.5
4-Mix	14.1	12.3	6.0	30.4	0	0	.5	22.2	6.0	8.2

SPRING BURN EVERY YEAR - FREQUENCY [Plants /M^2]

PLOT	BB	LB	SW	IN	LE	BE	BA
BB	12.6	0	0	0	0	0	0
LB+LE	0	1.3	0	0	1.8	0	0
BE	0	0	0	0	0	3.7	0
SW	0	0	1.3	0	0	0	0
BA	0	0	0	0	0	0	18.3
4-Mix	1.4	1.6	.7	4.2	0	0	0

SPRING BURN EVERY THREE YEARS - *% SPECIES COMPOSITION*

PLOT	BB	LB	SW	IN	LE	BE	BA	RU	WE	OP
BB	71.2	0	0	0	0	0	5.3	5.7	14.1	2.8
LB+LE	0	6.3	0	0	53.7	0	16.5	8.4	13.5	1.4
BE	0	0	0	0	0	23.5	38.4	22.8	15.2	0
SW	0	0	31.5	0	0	0	13.5	38.5	14.7	2.2
BA	0	0	0	0	0	0	64.8	17.2	16.9	.9
4-Mix	8.1	12.1	10.7	24.0	0	0	1.9	18.3	12.1	12.6

SPRING BURN EVERY THREE YEARS - FREQUENCY [Plants /M^2]

PLOT	BB	LB	SW	IN	LE	BE	BA
BB	10.3	0	0	0	0	0	0
LB+LE	0	.7	0	0	4.1	0	0
BE	0	0	0	0	0	4.2	0
SW	0	0	5.7	0	0	0	0
BA	0	0	0	0	0	0	17
4-Mix	1	1.9	1.3	3.2	0	0	0

PROJECT 13A151B - SILVOPASTURE DEMONSTRATION PROJECT

INTRODUCTION:

In past years, silvopasture studies were conducted by various research institutions in the southeast. They found that tree production and cattle production could be accomplished in one management regime. However, there is a lack of silvopasture demonstration at the present time. This study was established to demonstrate the establishment, management and maintenance of a system designed to produce several valuable products (cattle, pasture, and trees) over the long-term.

MATERIALS AND METHODS:

In 2000, longleaf pine trees were planted on the PMC. Containerized trees were planted on 6 foot spacing within a row with 10 feet between double rows and 40 feet between outside rows. Tree density was about 290 trees/Ac. Trees were planted into existing 'coastal bermudagrass' and 'pensacola' bahiagrass mixed pasture. Pasture was sprayed to reduce grass competition. Spraying was continued in 2002. **Dr. Goodman of Auburn University** is working with the PMC to produce maximum data and knowledge from this study concerning forage production, forage composition, and soil characteristics.

RESULTS AND DISCUSSION:

The overall objective of this project is to identify sustainable management approaches for maintenance of perennial pasture productivity and soil quality during (a) conversion to silvopasture and (b) establishment of rotational stocking within silvopasture. A successful stand of 'Dixie' crimson clover (*Trifolium incarnatum*) was obtained from the Fall 2004 planting. Pastures were sampled in January 2005 for fertilization requirements. Fertilizer was applied according to soil test recommendations in May; no fertilizer N was added to the clover treatment plots. The following information was gathered in 2005. In May, species composition measurements determined that canopy cover of crimson clover was approximately 15% in both bahiagrass (*Paspalum notatum*) silvopasture and open-pastures. Soil samples were collected at full clover bloom in May and again in early August at two points on 5 separate transects positioned perpendicular to the tree strips in each silvopasture and in a similar configuration in the open-pasture paddocks. On each transect, one sample site was located 1 m from the center of the tree base and the other at the midpoint between adjacent sets of tree strips. In May, the samples were analyzed to characterize percent water-stable aggregates (aggregate stability); soil compaction was measured *in situ* at 5-cm increments to 20 cm in July. In August, 15-cm soil cores were collected to characterize root biomass. Shoot biomass above 5 am was clipped from 10 0.25-m^2 quadrats in each paddock along transects at points used for soil sampling in May, July and August. No treatment or spatial differences were found in percent water-stable aggregates (%WSA) however, there was a significant temporal difference as %WSA increased overall by 23% in August versus June. Soil strength (J/m^2) increased with depth however, sample sites closest to the tree base showed a 50, 56 and 43% reduction in soil strength at 5, 10 and 15 cm, respectively. There were no shoot biomass yield differences as a result of spatial comparisons in May however, clover-treatments had a significantly higher biomass yield by 28% in clover- versus comparable N-fertilizer treatment paddocks. No differences in shoot biomass yield were detected in July however, in the silvopastures in August, there was a significant 10% reduction in biomass yield at sampling points closest to the tree line. Weather stations were located in silvopasture (5-yr old *Pinus palustrus*) and open pasture at Americus and Chipley FL (20-yr old *Pinus taeda*). Cattle will be added to the study in 2006. They will graze open pasture, silvopasture ,clover and N-fertilizer treatment plots beginning in 2006. In addition ,a native warm season grass silvopasture demonstration has been established in Early Co. Georgia. This will demonstrate planting and establishment techniques to area farmers using switchgrass, indiangrass, big bluestem, little bluestem, and eastern gamagrass.

Silvopasture Study in 2003

Dixie Crimson Clover being planted for additional study evaluation in Fall 2004

Crimson Clover Planting May 2005

Silvopasture Study May 2005

Cattle Watering Troughs and fence posts installed in 2005

Early Co Georgia Silvopasture Demonstration with Native Warm Season Grasses
(Farmer,PMC Asst Manager,Blakely DC,GA PMS, Silvopasture Landowner)

Evaluation of Native Grasses in Summer 2005
(Silvopasture Landowner, Georgia State Conservationist, Blakely DC)

PROJECT 13A152R- ROTATIONAL GRAZING MANAGEMENT OF A MIXED NATIVE GRASS PASTURE

INTRODUCTION:

Native grass pasture systems are used commonly in the Midwestern U.S. However, these systems are rarely utilized in the Southeastern United States. This study attempts to establish a mixture of native warm season grasses and to demonstrate their use in a managed rotational grazing system.

MATERIALS AND METHODS:

In April 2001 the PMC planted a 5-acre native mixed grass pasture using a Truax no-till drill. Since the planting area is sandy soil, a cover of oats was grown to stabilize the soil. Before planting the warm season grasses, the oats were sprayed with herbicide. The oat field was not mowed before planting because the mowed debris can interfere with the planting mechanisms of the planter. The oats were not completely killed before planting. Drill was set to plant switchgrass ('Cave in Rock' and 'Alamo' combined) at 4 # pls/Ac, 'Americus' indiangrass at 2.5 # pls/Ac, Knox City PMC selection of little bluestem at 4.1 # pls/Ac, and 'Earl' big bluestem at 2.5 # pls/Ac. Each year the entire pasture is burned.

RESULTS AND DISCUSSION:

In 2002-2005 transects of the field were conducted to determine the percent species composition of the mixture after establishment. The results were as follows:

% Species Composition of Native Mixture from 2002-2005

PLANT SPECIES	2002	2003	2004	2005
ALAMO	25	40	40	48.8
CAVE in ROCK	7	12	14.5	8.8
AMERICUS	4	2	11	5
EARL	5	14	16.5	16.3
LITTLE BLUESTEM	12	8	11	5
WEED/OPEN	47	24	7	16.1

Through 2005" Alamo " switchgrass continues to dominate the stand. "Earl" big bluestem is the only other entry to show some competition with the dominate "Alamo". Also in 2005 the Georgia Forestry Commission and the staff of the Jimmy Carter PMC utilized the mixed native grass pasture for a prescribed burning demonstration In 2006 this pasture will be available for emergency grazing by the silvopasture cattle.

Native Mixed Grass Pasture in Southeast Corner of Plant Materials Center

Georgia Forestry Commission review prescribed burn and safety techniques

Fire line establishment is demonstrated

In addition to burn and safety techniques smoke management was also demonstrated

PROJECT GAPMC-T-0154-CP ALTERNATIVE CROPS FOR SMALL FARMER'S DEMO AT THE JIMMY CARTER PMC (PHARMACEUTICAL PLANTS)

INTRODUCTION:

Humans have utilized plants for thousands of years. For example therapeutic agents for treating many aliments are derived from various herbs. Several plants produce economically important organic compounds such as phytochemicals and pesticides. The USDA-ARS is looking at many legumes for pharmaceutical purposes such as Velvetbean (contains L-DOPA, which is used to treat Parkinson's disease). Dr. Morris with ARS (Griffin Georgia) states many obscure legumes can provide valuable multiple resources in addition to medicines such as human food, animal feed, cover crops, green manure and erosion control. This study will attempt to assemble, grow, increase and demonstrate new and different crops for small farmers. These farmers will subsequently produce valuable plant material for many uses including medicine, food, and conservation.

MATERIALS AND METHODS:

In 2005 the PMC grew several species of important pharmaceutical plants that do not produce seed at Griffin Georgia.

RESULTS AND DISCUSSION:

In 2005 the PMC grew the following plant taxa for potential work by Dr Brad Morris and the pharmaceutical industry. Seed for future increase and study was delivered to Dr Morris in January 2006.

PI Number	Taxa	Country of Origin	Pharmaceutical Use
182969 (GUAR)	*Cyamopsis tetragonoloba*	India	Dietery Fiber and Flavones
338584 (Jack Bean)	*Canavalia ensiformis*	Costa Rica	Con A lectin for diagnostics
164695 (Jack Bean)	*Canavalia ensiformis*	India	Con A lectin for diagnostics
365414 (Velvet Bean)	*Mucuna pruriens var utilis*	Mozambique	Antiparkinsonian
365415 (Velvet Bean)	*Mucuna pruriens var. utilis*	Mozambique	Antiparkinsonian
543241 (Sesame)	*Sesamum indicum*	Bolivia	Variable in tocopherol
263879 (Guar)	*Cyamopsis tetragonoloba*	India	Dietary Fiber and Flavones
561704 (Sesame)	*Sesamum indicum*	Mexico	Variable in tocopherol
340253 (Guar)	*Cyamopsis tetragonoloba*	India	Dietary Fiber and Flavones
215201 (Bundleflower)	*Desmanthus illinoensis*	Nebraska US	Dermatological Aid
286455 (Jap. Lespedeza)	*Kummerowia striata*	Japan	Anti Tumor , Anti Aids

Jack Bean Pods before harvest in August 2005

Velvet Bean Blooms in Pharmaceutical Project 2005

Sesame blooms with some developing seed pods

Researcher from Alabama A&M University discuss Pharmaceutical uses of Alternative Crops at the Conference for Small Farmers held at Jimmy Carter PMC in September 2005

PROJECT GAPMC-T-0155-GW CARBON SEQUESTRATION STUDY

INTRODUCTION:

Concerns over global warming have increased interest in carbon and carbon sequestration. Scientists estimate agriculture is responsible for about 7 % of the total U. S. contribution of greenhouse gases. Plants remove carbon dioxide from the atmosphere and store it in plant parts as carbon. When plants die and decompose some carbon is released back to the atmosphere while some is sequestered as soil carbon, especially under conservation tillage systems. This amounts to a natural giant carbon storage sink. This study will compare annual and perennial crops ability to sequester carbon. This will be determined by soil organic matter testing of several entries in a long-term study.

MATERIALS AND METHODS:

A randomized complete block design with four replications was planted to 'Earl' big bluestem, 'Tropic' Sun Hemp, 'Iuka' eastern gamagrass and 'Alamo' switchgrass in May 2001. Soil organic matter content over time will be the main measured variable.

RESULTS AND DISCUSSION:

In 2001, a base line mean soil organic matter content was determined for future reference. In 2002 - 2004 soil organic matter was measured from each entry at 0-2 inch depth and 2-6 inch depth. Due to deer browse “Tropic” can not be maintained in plots and will be considered a non-planted check . Measurable differences should be recorded over time. Soil samples were taken for the 2005 season, however due to delay in soil analysis data from 0-2 and 2-6 inch soil depth will be reported in 2006 ATR.

2002-2004 Mean % Organic Matter Content of Soil

Cultivar	*0-2 Inch Soil Depth*	*2-6 Inch Soil Depth*
Alamo	1.95/1.71/2.42	1.65/1.39/1.60
Earl	2.0/1.80/2.44	1.67/1.54/1.55
Iuka	1.88/1.85/2.23	1.72/1.64/1.54
Tropic	1.89/1.78/2.42	1.66/1.45/1.57

Iuka Eastern Gamagrass shows Potential as Carbon Sequester

PROJECT GAPMC-P-0456-WL LONGLEAF PINE NATIVE UNDER STORY PLANT COLLECTION AND INCREASE STUDY

INTRODUCTION:

The longleaf pine ecosystem of the Southeast is one of the most threatened in the United States. The loss of longleaf pine forests and related plant communities not only jeopardizes the extant plant species but also the native fauna that depend on the resources and structure provided by the vegetation. The objectives of this study are to locate, collect, and grow various native grasses, legumes and forbs which make up the understory vegetation of longleaf pine forest of the southeast United States. Later, seed will be increased for field planting and distribution to growers Any seed produced by small farmers from these native seeds will be marketed for planting on CRP longleaf pine sites. Also seed grown by small farmers will be used to "restore" natural areas to longleaf pine and its native understory plant species.

MATERIALS AND METHODS:

Old growth longleaf pine sites have been identified in Southwest Georgia for seed collection. The PMC staff will collect longleaf pine understory seed from locations in Worth, Irwin, and Decatur Counties Georgia. The longleaf pine understory vegetation will be grown on upland soil at the JCPMC. The soil series is orangeburg sand loam. New Material will be added as needed. Plant Material will be in rod rows, 20 feet long and 6 foot spacing and 10 foot alleys. Basic phenological notes will be taken on the accessions. Seed will then be placed into increase blocks at the PMC for seed production and future use. Since this study is primarily a collection and increase of native understory vegetation for longleaf pine no statistical design will be employed**.**

RESULTS AND DISCUSSION:

The following is a list of taxa collected in 2004: Pineywoods Dropseed *Sporobolus junceus*, *Helianthus radula,* Little Bluestem *Schizachyrium scoparium, Lespedeza angustifolia, Lespedeza hirta ,Lespedeza virginica,* Wiregrass *Aristida stricta,* Grass Leaved Golden Aster *Pityopsis adenolepis,* Blue Sage *Salvia* azurea, Sweet Goldenrod *Solidago odora, Crotalaria purshii,* Pencil Flower *Stylosanthes biflora,* Scurf Pea *Psoralea canescens,* Sensitive Brier *Schrankia microphylla,* Goat's Rue *Tephrosia virginiana,* Dollar Plant *Rhynchosia reniformis,* Wild Indigo *Baptisia lanceolata,* Black-Eyed Susan *Rudbeckia hirta, Andropogon gyrans.* In 2005 Queens delight *Stillingia sylvatica* , Split beard bluestem *Andropogon ternarius* , Dusty clover *Lespedeza capitata* , Rattle-box *Crotalaria rotundifolia,* Purple Elephants- foot *Elephantopus nudatus* was added to the seed collection. PMC staff will attempt to collect more seed from the same areas in 2006 for later planting at PMC.

Seed Collection in Worth Co Georgia

PROJECT GAPMC-T-0457-WL ASSEMBLY OF PLANTS FOR BOBWHITE QUAIL HABITAT IMPROVEMENT

INTRODUCTION:

There is renewed interest in plant material for use in wildlife habitat improvement. The Georgia Department of Natural Resources and the Georgia NRCS is involved in improving wildlife habitat on landowners property throughout the state. The bobwhite quail initiative designed to improve bobwhite quail habitat has received much national and local attention. This new special planting was installed to demonstrate to landowners and other cooperators the potential of plant materials for use in wildlife habitat improvement.

MATERIALS AND METHODS:

All material was selected to demonstrate use of plants for wildlife cover, nesting and food. This demonstration especially emphasizes wildlife habitat improvement for bobwhite quail in the Southeastern U.S. Plant cultivars, and accessions displayed included 20 big bluestem collected from the Southeastern U.S. and selected by NRCS biologists for bob white quail habitat improvement, Oklahoma Select little bluestem, Cave-in-Rock switchgrass, Wabasso switchgrass, Stuart switchgrass , Martin eastern gamagrass, St. Lucie eastern gamagrass, Arkansas selection of big bluestem, Citrus maidencane, Illinois bundleflower, ragweed , teosinte, Florida Paspalum, and partridge pea.

RESULTS AND DISCUSSION:

On September 20, 2005 landowners and cooperators observed the Bob white Quail habitat improvement study during the Jimmy Carter Plant Materials Center Wildlife Field Day and Tour. Participants included the following: Flint River Soil and Water Conservation District, Lower Chattahoochee River Soil & Water Conservation District, Georgia Soil and Water Conservation Commission, Georgia DNR, Fort Valley State University, Clemson University, NRCS, bobwhite quail enthusiasts, Quail Unlimited, Truax Company, Sharpe Bros Seed Company, Pennington Seed Company, Georgia Forestry Commission, USF&WS, wildlife plant nurserymen, Tuskegee University, and local landowners. Similar events are planned for the future. In 2005 Wildlife plantings were also established off the PMC on several farms in Georgia. These sites will provide information on different soils and plant materials.

Bobwhite Quail Habitat Improvement Study

2005 Wildlife Field Day(Conference Room Session) at Jimmy Carter PMC

Landowner in Lowndes Co Georgia discuss switchgrass planting with Georgia Plant materials Specialist

PLANTS SHIPPED IN 2005

PLANT MATERIAL	AMOUNT SHIPPED
Amquail *Lespedeza thunbergii*	10# Seed
Flageo *Spartina patens*	18 plants
Americus Indiangrass *Sorghastrum nutans*	38 # Seed
Ellagood Autumn olive *Eleageus umbellata*	20 Plants
Sharpe *Spartina patens*	2000 plants
Big O Crabapple *Malus coronaria*	9 Plants
Sumter Daylily *Hemerocallis fulva*	50 Plants

SEED AND VEGETATIVE STOCK PRODUCERS

PLANT MATERIAL	PRODUCER
AMCLO Arrowleaf Clover *Trifolium vesiculosum*	Georgia Crop Improvement 2425 S Milledge Ave Athens, Georgia 30605 R&R Seeds 724 Beall Springs Rd Gibson, Georgia 30810
Ambro Virgata Lespedeza *Lespedeza virgata*	Ga Crop Improvement 2425 S Milledge Ave Athens, Ga 30605
Pensacola Bahiagrass *Paspalum notatum*	Ga Crop Improvement 2425 S Milledge Ave Athens, Ga 30605 Adams-Briscoe Seed Co P O Box 19 Jackson Ga 31634 Conlee Seed Co Star Route Box 8 A Plainview TX 79073 Douglas King Co Inc 4627 Emil Rd PO Box 200320 San Antonio TX 78220 Texas Seed CO PO Drawer 599 Kenedy, Tx 78119
Dove Proso Millet *Panicum miliaceum*	Ga Crop Improvement 2425 S Milledge Ave Athens, Ga 30605 Adams- Brisco Seed Co PO Box 19 Jackson, Georgia 31634 Turner Seed Co Rt 1 Box 292 Breckenridge TX 76024

SEED AND VEGETATIVE STOCK PRODUCERS

PLANT MATERIAL	PRODUCER
Ellagood Autumnolive *Elaeagnus umbellata*	McCorkle Nursery RT 1 Dearing Ga 30808 HoneyHole Nurseries 3211 Piney Woods Lake Rd. Glenwood Ga. 30428 Hamilton Nursery PO Box 871 Thomson, Ga 30824
GA-5 Tall Fescue *Lolium arundinacea*	Adams-Briscoe Seed Co PO Box 19 Jackson Ga 31634 Pennington Seed Co Madison Ga
Sumter Orange Daylily *Hemerocallis fulva*	Hamilton Nursery PO Box 871 Thomson Ga 30824
Amquail *Lespedeza thunbergii*	Alabama Crop Improvement South Donahue Dr Auburn, Ala 36849 Julian Brown 125 Court St PO Box 8 Morrow, Ga 30655 Adams_Briscoe Seed Co PO Box 19 Jackson Ga 30733 Lambert Seed and Supply Hwy 28 W PO Box 128 Camden Ala 36726 Morgan Dunn Rt 5 Box 105 Troy Ala Edwin Hammond Rt 2 Box 270 Reform Ala 35481 Ronnie Forbis Rt 1 Box 666 Mt Crogham SC 29727

SEED AND VEGETATIVE STOCK PRODUCERS

PLANT MATERIAL	PRODUCER
Flageo Marshhay Cordgrass *Spartina patens*	JCPMC 295 Morris Dr Americus Ga 31719 Dr Latimore School Of Agriculture Fort Valley State University Fort Valley Ga 31030 William Smith Rt 2 Box 94 A Wigham Ga 31719 Okefenokee Growers Maybluff Rd Folkston GA 31537
Sharp Marshhay Cordgrass *Spartina patens*	JCPMC 295 Morris Dr Americus Ga 31719 Brooksville PMC 14119 Broad St Brooksville Fla 34601 Okefenokee Growers Maybluff Rd Folkston Ga 31537
Restorer Giant Bulrush *Scirpus californicus*	Varn Companies PO Box 4488 Jacksonville Fla 32201 Flowerwood Nursery Inc 6470 Dauphin Island Parkway Mobile Ala 36605
Au Sunrise Crimson Clover *Trifolium incarnatum*	Ala Crop Improvement S Donahue Dr Auburn, Ala36849

SEED AND VEGETATIVE STOCK PRODUCERS

PLANT MATERIAL	PRODUCER
Wetlander Giant Cutgrass *Zizaniopsis miliacea*	Varn Companies PO Box 4488 Jacksonville Fla 32201 Flowerwood Nursery Inc 6470 Dauphin Island Parkway Mobile Ala 36605
Big O Crabapple *Malus coronaria*	HoneyHole Nurseries 3211 Piney Woods Lake Rd Glenwood Ga 30428

PMC TRAINING ACTIVITIES - 2005

22 TRAINING EVENTS HELD AT PMC FOR A TOTAL OF 43 TRAINING DAYS

RELEASES FROM JIMMY CARTER PMC

Common Name (Year of Release)	Scientific Name	Primary Use
'Pensacola' Bahiagrass ('44)	*Paspalum notatum*	Forage Production
'Amclo' Arrowleaf Clover ('63)	*Trifolium vesiculosum*	Forage Production
'Ambro' Virgata Lespedeza ('71)	*Lespedeza virgata*	Roadbank stabilization
'Dove' Proso Millet ('72)	*Panicum miliaceum*	Wildlife Food
'Ellagood' Autumn Olive ('86)	*Elaeagnus umbellata*	Wildlife Food
'Amquail' Thunberg Lespedeza ('87)	*Lespedeza thunbergii*	Wildlife Food and Cover
'Flageo' Marshhay Cordgrass* ('90)	*Spartina patens*	Beach Stabilization
(The 'Flageo' Marshhay Cordgrass release involved a cooperative effort with Fort Valley State Univ.)		
'GA-5' Tall Fescue ('92)	*Festuca arundinacea*	Forage Production
(The 'GA-5' Tall Fescue release involved a cooperative effort with the University of Georgia)		
'Big O' Crabapple* ('92)	*Malus coronaria*	Wildlife Food
'Sumter Orange' Daylily ('93)	*Hemerocallis fulva*	Landscape Beautification
'Doncorae' Brunswickgrass ('93)	*Paspalum nicorae*	Waterways Stabilization
'Wetlander' Giant Cutgrass* ('93)	*Zizaniopsis miliacea*	Constructed Wetlands
'Restorer' Giant Bulrush* ('93)	*Scirpus californicus*	Constructed Wetlands
'Americus' Hairy Vetch ('93)	*Vicia villosa*	Winter Cover Crop and Conservation Tillage
(The 'Americus' Hairy Vetch release involved a cooperative effort with the University of Georgia)		
'AU Early Cover' Hairy Vetch ('94)	*Vicia villosa*	Winter Cover Crop and Conservation Tillage
(The 'AU Early Cover' Hairy Vetch release involved a cooperative effort with Auburn University)		
'AU Ground Cover' Caley Pea ('94)	*Lathyrus hirsutus*	Winter Cover Crop and Conservation Tillage
(The 'AU Ground Cover' Caley Pea release involved a cooperative effort with Auburn University)		
'Sharp' Marshhay Cordgrass* ('94)	*Spartina patens*	Beach Stabilization
(The 'Sharp' Marshhay Cordgrass release involved a cooperative effort with NRCS PMC in Brooksville, Florida)		
'AU Sunrise' Crimson Clover ('97)	*Trifolium incarnatum*	Winter Cover Crop and Conservation Tillage
(The 'AU Sunrise' Crimson Clover release involved a cooperative effort with Auburn University)		
'Americus' Indiangrass * (2002)	*Sorghastrum nutans*	Forage, landscape, restoration
(The 'Americus' Indiangrass release involved a cooperative effort with Alabama Crop Improvement)		
'Highlander' Eastern Gamagrass * (2003)	*Tripsacum dactyloides*	Forage, buffer, conservation
(The 'Highlander' release involved Coffeeville Miss PMC as primary with MAEP)		
' Kinchafoonee' Virginia Wildrye* (2004)	*Elymus virginicus*	Conservation, log roads, restoration
' Newberry' Indiangrass* (2005)	*Sorghastrum nutans*	Conservation buffers,wildlife habitat,urban landscape, restoration and critical areas

'Union' Purpletop* (2005)	*Tridens flavus*	Conservation buffers,wildlife habitat, urban landscape,restoration and critical areas

(Newberry and Union release involved cooperative effort with USDA-USFS and SC Native Plant Society)

'Durham' Switchgrass* (2005)	*Panicum virgatum*	Conservation buffers, wildlife habitat,urban landscapes, restoration and critical areas

***Native plants**

Georgia Plant Materials Specialist explains Big Bluestem Study to Landowner at Native Grass Conference for Small Farmers held at PMC September 7-8 2005

For more information concerning the plant materials center and its conservation efforts, contact the center's manager at 295 Morris Drive, Americus, Georgia 31709. Phone: (229) 924-4499 or 924-7003.