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Jamie L. Whitten Plant Materials Center

2013 Annual Technical Report **May, 2014**

United States Department of Agriculture
Natural Resources Conservation Service
Jamie L. Whitten Plant Materials Center

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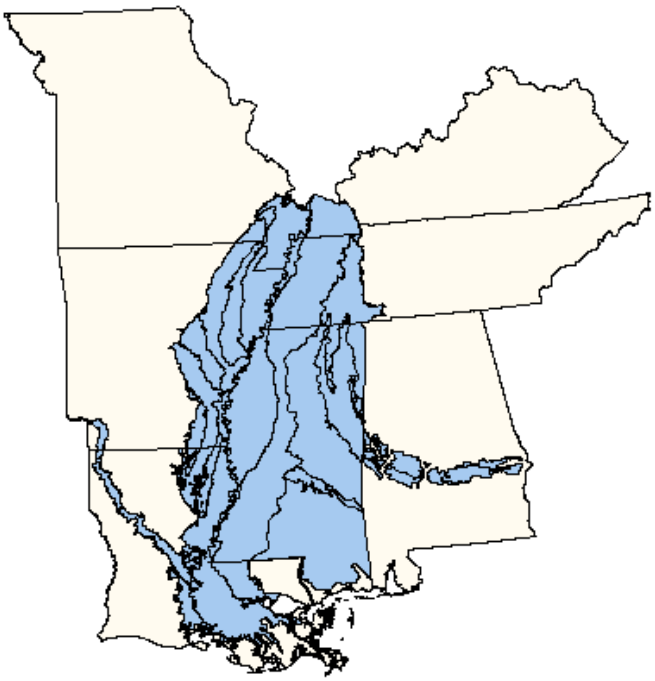
MSPMC Staff:

Delmer Stamps – Acting manager
Tommy Moss – Agronomist
Jon Allison – Gardener
Delon Price – WAE
Rhonda Goolsby – Secretary

Introduction:

The Jamie L Whitten Plant Materials Center (MSPMC), located near Coffeeville, Mississippi, is operated by the USDA Natural Resources Conservation Service. Our mission is to select, test and transfer state-of-the-art plant materials and technology to meet the resource needs of a myriad and diverse customer base within our service area. Our program has developed an excellent internal system for identifying future plant materials needs, which is coupled with a seamless system of product development and program delivery. By working with a broad range of plant species, including grasses, forbs, and shrubs, the MSPMC seeks to address priority needs of its customers in NRCS field offices and land managers in both the public and private sector.

The MSPMC works closely with its customers to develop solutions for a broad range of conservation concerns and issues. Cropland erosion control, pastureland improvement, critical area erosion control, including urban conservation concerns, water quality improvement, and wildlife habitat enhancement are the major conservation issues in our service area, which includes the state of Mississippi (excluding the coastal counties), the delta regions of Arkansas, Louisiana, Tennessee, Missouri, Kentucky, and the Blackland Prairie of Alabama.



Activities:

In order to develop improved resource technology, the MSPMC carries out numerous research studies, both on the center and at other locations within our service area. We often work cooperatively with other agencies and organizations in carrying out this research. Cooperators include the Mississippi Agricultural and Forestry Experiment Station (MAFES), Mississippi State University, Alcorn State University, Mississippi Association of Conservation Districts, Mississippi Soil and Water Conservation Commission, USDA Forest Service, and USDA Agricultural Research Service, and as well as other federal and state agencies and entities within NRCS.

The purpose of this publication is to provide information on studies actively being pursued at the MSPMC during 2013. Any results should be regarded as preliminary and should not be utilized until further testing is completed. An in-depth research report or summary is written after the completion of each study and is published annually in a MSPMC Technical Reports publication. Past reports and summaries are available from the MSPMC or are available on the MSPMC web site.

MSPMC Site Information:

The MSPMC occupies more than 360 acres of land (200 acres in open fields) within the Holly Springs National Forest. The growing areas consist of both bottomland and upland fields, with most being of irregular size and shape, defined by streams, drainages, roads, and other topographic features. Bottomland fields are composed primarily of Oaklimeter silt loam soils, which are acidic and often wet. With proper drainage and management, these soils can become very productive. Soils on upland sites are predominantly Loring and Grenada silt loams with fragipans. These soils are also acidic and moderately to highly productive. The latest soil testing reports can be found in the 2006 Annual Technical Report.

2013 Climate Data at the Jamie L. Whitten Plant Materials Center, Coffeeville, MS: (Source: MesoWest, University of Utah)

	Average Air Temperature					Average Relative Humidity			Precipitation
Date	Deg F					%			in
mm/yyyy	Ave.	Ave. Daily Max.	Max.	Ave. Daily Min.	Min.	Ave.	Max.	Min.	Total
01/2013	45.27	56.19	79	36.61	23	78.82	100	26	7.17
02/2013	44.57	55.86	71	33.82	22	71.02	99	20	3.37
03/2013	47.87	59.61	77	35.29	18	67.21	100	20	4.42
04/2013	60.05	73	86	47.73	33	73.55	100	21	6.61
05/2013	67.14	78.58	88	56.13	32	78.98	100	28	6.16
06/2013	76.43	87.87	94	65.83	53	79.88	100	32	4.1
07/2013	76.97	88.13	96	67.13	57	80.91	100	32	3.58
08/2013	78.01	90.97	98	67.9	59	80.99	99	37	2.9
09/2013	74.25	88.8	99	62.87	51	75.45	98	29	4.68
10/2013	62.39	74.35	88	52.45	34	83.25	98	31	4.11
11/2013	47.62	59.73	75	37.2	18	74.93	98	20	5.8
12/2013	42.48	53.03	79	33.55	21	81.28	99	22	5.75

2013 Publications

1. "Growing and Managing Sunflowers for Dove Fields in the Southeast" – The Mississippi State University Extension Service and NRCS joint publication
2. Fall 2013 newsletter
3. Summer 2013 newsletter
4. 2012 Progress Report of Activities
5. 2012 Annual Technical Report

Special Projects

1. USFS Seed Collection: MSPMC collects native seeds for re-seeding natural areas in the Desoto and Homochitto National Forests in MS.

2. Cover crop investigations cooperating with Arkansas Plant Materials Center.

Active Studies

Effects of Cover Crops on Sweet Potato [*Ipomoea batatas* (L.) Lam.] Yield, Grade and Soil –Borne Insect Injury, and Field Soil Loss and Soil Quality

Study Number:	MSPMC-T-0701-CR
Study Leader:	MSPMC
Duration:	2006-2009 (3 growing seasons)
Cooperators:	Robert Wimbish (Agronomist, NRCS), Dr. Bill Burdine (MSU), Dr. Seth Dabney (ARS-NSL), Earp Farms

Introduction:

Sweet potato [*Ipomoea batatas* (L.) Lam.] is a crop which still utilizes conventional tillage in its production in Mississippi. The primary issue in the use of reduced tillage or cover crops has been the problem with winter weeds or cover crops harboring insects that pose a threat to the sweet potato crop. However, with the Conservation Security Program (CSP) being initiated, there is a need to reexamine production methods that will bring the Soil Conditioning Index (SCI) for sweet potato production to a positive value. Critical to a positive SCI are reduced tillage systems, crop rotations, and the use of cover crops.

Cover crops will be evaluated as part of a conservation tillage management system in the production of sweet potato. Based on previous work the selected treatments are show in Figure 1, the RCB plot design for the study. Plots will be 4 rows wide by 35 feet long with 10’ alleys between the replications and at the ends of the block.

Treatments 2-8 will receive following tillage operations: fall disc, fertilize, disc, bed, roll/drag beds, seed cover crops. Plots will receive burndown herbicide (glyphosate) application late March/early April.

Evaluations will include %cover, dry matter production, sweet potato yield (grade).

References:

Herby Bloodworth and Mike Lane, Technical Note No. 9, 1994, PROJECT REPORT SWEET POTATO RESPONSE to COVER CROPS and CONSERVATION TILLAGE.

Herby Bloodworth and Mike Lane, Technical Note No. 10, 1995. PROGRESS REPORT, Establishment Methods of Sweetpotato in a Conservation Tillage System

Herby Bloodworth, Larry Golden, and Ken Ainsworth, Technical Note Vol. 12 No. 11. December 1996. Cover Crops and C-factors for Conservation Tilled Sweetpotato

Scott Edwards, Herby Bloodworth, and Mike Lane, Technical Note Vol. 13 No. 5, February 1998. Establishment Methods of Sweetpotato in a Conservation Tillage System.

Scott Edwards, Bill Benoist, Herby Bloodworth and Mike Lane , Technical Note Vol. 13 No. 6, June 1998. A Guide to Conservation Tillage Sweetpotato Production.

R.C. Sloan, Jr., N.W. Buehring, W.B. Burdine, Jr., and J. L. Main. Sweetpotato Coover Crops and Reduced Tillage. North MS Research and Extension Report. 1993.

W.B. Burdine, Jr., J.G. White, P.G. Thompson, and J.L. Main. Cover Crop Soil Conservation System for Sweetpotato Production. 2000.

Propagation Methods of Rivercane [*Arundinaria gigantea* (Walt.) Muhl.]

Study Number:	MSPMC-T-0701-TE
Study Leader:	MSPMC
Duration:	2007-2011
Cooperators:	John Ouellette, Research coordinator, Memphis Zoo; Dr. Scott Franklin, Asst. Prof. Dept of Biology, Univ. of Memphis, Brian Rude, Assoc. Prof., Dept of Animal and Dairy Sciences, and Dr. Brian Baldwin, Assoc. Prof. Agronomy, Dept. of Plant and Soil Sciences, MSU.

Introduction:

Rivercane [*Arundinaria gigantea* (Walt.) Muhl.] has been widely displaced in its native range. Attempts to reestablish the species is limited by methods of propagation and planting. Methodologies developed for propagation of bamboo will be assessed for its application to rivercane. If methodologies prove successful, this will provide the plant materials to establish this native species back to its native range, providing a unique habitat for wildlife**.**

Rivercane is the largest native grass in the U.S. It occurs in the southern and southeastern states from Texas and Oklahoma and eastward to West Virginia, Delaware and Florida. Tecta and gigantea are two subspecies of *Arundinaria gigantea*. Rivercane is a culturally significant plant for the Mississippi Band of Choctaw Indians. Cane fiber is used in Choctaw basketry and other tribal crafts. Limited research has been conducted to determine a method for propagating cane. One promising method is to plant culms and rhizomes, and culms attached to rhizomes. Reports indicate that planting culms with attached rhizomes provide larger, more vigorous plants than culms planted alone. Objective of this study is to determine if greenhouse propagation of rivercane (subspecies tecta) is possible and evaluate different propagation mediums.

Switchgrass (*Panicum virgatum* L.) Tolerance
to Common Agricultural Rates of Glyphosate

Study Number: MSPMC-T-0701-BU
Study Leader: MSPMC
Duration: 2007-2009

Introduction:

The Vegetative Barrier Practice Standard 601 was adopted in 2001. This technology has demonstrated the ability to use narrow strips (3 feet) of dense, stiff stemmed vegetative material (e.g. switchgrass (*Panicum virgatum* L.)) to serve as vegetative terraces, vegetative filter strips, and vegetative check dams for trapping sediment, deconcentrating flow, and stabilizing headcuts.

However, as the primary area of application is cropland, and with the proliferation of herbicide (glyphosate) tolerant crops, there has been an unwillingness within the conservation community to install this practice for fear of vegetative injury or death from herbicide drift. This has prevented widespread utilization of this vegetative practice and has prevented acceptance of this practice as a cost-share practice within Mississippi.

The purpose of this study is therefore to document the herbicide (glyphosate) tolerance of switchgrass (‘Alamo’) under establishment and established conditions. Additionally the clipped and unclipped established vegetative barrier conditions will be evaluated. The study will also incorporate a herbicide that will kill switchgrass to demonstrate that switchgrass control is not being compromised by building herbicide resistance to glyphosate.

Improving Soil Degradation Created by Vegetative Barriers

Study Number: MSPMC-T-0112-CP
Duration: 2001-2006
Cooperators: Seth Dabney, Agronomist, ARS, Oxford, MS

Introduction:

Conservation Practice Standard 601 was developed to govern the use of vegetative barriers to control erosion in sloping cropland. These barriers are highly effective in preventing soil from leaving agricultural fields, but because soil is moved through tillage and erosion from the upper portion of the area between the barriers and deposited above the next barrier, soil quality below each barrier decreases.

Objectives of the study are: 1) determine if benching has altered soil properties affecting crop productivity; 2) determine effectiveness of management alternatives at varying positions within benches for restoring crop productivity and profitability.

Treatments:

1) No poultry litter
2) 1X rate (4 tons) of poultry litter
3) 2X rate (8 tons) of poultry litter

Tillage (disking) vs. no tillage over all litter treatments
Deep tillage (paratilling) vs. no deep tillage immediately below the hedge only

Agroforestry Alley Cropping Demonstration

Study Number:	MSPMC-T-0117-CP
Duration:	2001-2010
Cooperators:	National Agroforestry Center; Jim Robinson (ret.), NRCS, Ft. Worth, TX, Jerry Lemunyon, NRCS, Ft. Worth, TX and Seth Dabney, USDA-ARS, Oxford, MS

Introduction:

Agroforestry combines agriculture and forestry technologies to create diverse, profitable and sustainable land-use systems. One of the agroforestry practices that may appeal to many landowners is alley cropping (Conservation Practice 311). Alley cropping is the planting of trees or shrubs with agronomic, horticultural or forage crops cultivated in the alley between the rows of woody plants, giving farmers the option of growing different crops in the same field to create a diversified farming enterprise. Conservation benefits of alley cropping include but are not limited to reducing surface runoff and erosion, improving nutrient management, and increasing wildlife habitat.

In 2002 the PMC began cooperating with the National Agroforestry Center to demonstrate the potential for alley cropping in the Southeast using high value trees combined with no-till crops planted on sloping topography. A 5 acre hillside of Loring silt loam soil (up to an 8% slope) at the PMC was chosen as the study site. Trees were planted in single rows along the general contour of the field and perpendicular to the dominant slope on angles convenient for farming using the CORE4 recommendations. Trees species include pecan [*Carya illinoinensis* (Wangenh.) K. Koch], which will provide an intermediate income from nut production in addition to future timber production, and green ash (*Fraxinus pennsylvanica* Marsh.), which is a fairly fast-growing timber species.

Evaluation of Low Growing Switchgrass (*Panicum virgatum* L.) Ecotypes for Reduced Seed Dormancy

Study Number: MSPMC-P-0208-BU
Duration: 2001-2010
Cooperators: Brian Baldwin and Paul Meints, Mississippi State University

Introduction:

Many of the switchgrass cultivars that were released by the PM program, University, and ARS grass breeders are tall, robust types that may not be as well suited as low-growing ecotypes for some conservation practices such as vegetative barriers (Conservation Practice 601), critical areas (Conservation Practice 342), and wildlife habitat plantings (Conservation Practice 645) in the southeastern U.S. Selection for reduced seed dormancy in switchgrass (*Panicum virgatum* L.) has been shown to be a viable method for cultivar development. The PMC has an assembly of 92 collections of switchgrass with varying heights ranging from tall (7-8 or more ft), medium (5-6 ft), and short (4-3 ft) from which new selections can be made for cultivar release. We are using recurrent selection breeding techniques, selecting seedlings that germinate in the shortest period of time from switchgrass accessions in the short stature range that will then be allowed to cross and produce a short cultivar that establishes quickly to out-compete weeds.

Selecting for Improved Seedling Establishment in Beaked Panicum (*Panicum anceps* Michx.)

Study Number: MSPMC-P-0209-BU
Duration: 2002-2006
Cooperators: Brian Baldwin and Paul Meints, Mississippi State University

Introduction:

The PMC evaluated large collections of numerous accessions of beaked panicum (*Panicum anceps* Michx.) in the 1980s and the East Texas PMC is currently evaluating several accessions. Beaked panicum is not highly productive as a forage crop, but it has potential for critical area stabilization and is shade tolerant. Beaked panicum is a component of the short grass prairie of North America. Seeds exhibit dormancy that affects germination. Stratification has been shown to overcome this dormancy, but stratified seeds would be difficult to plant using conventional equipment. Selection for reduced dormancy has been illustrated in native warm-season grasses such as switchgrass (*P. virgatum* L.) and these techniques may also be possible to develop beaked panicum sources with reduced dormancy.

Selecting for Improved Seedling Establishment in Purpletop [*Tridens flavus* (L.) A.S. Hitchc.]

Study Number: MSPMC-P-0210-BU
Duration: 2002-2006
Cooperators: Brian Baldwin and Paul Meints, Mississippi State University

Introduction:

The PMC evaluated a large collection with numerous accessions of purpletop [*Tridens flavus* (L.) A.S. Hitchc.] in the 1980s. Purpletop is a component of the short grass prairie of North America. It has limited potential as a forage crop, but can be used for critical area stabilization and has some shade tolerance. Seeds exhibit dormancy that adversely affects germination. Stratification has been shown to overcome this dormancy, but stratified seeds would be difficult to plant using conventional equipment. Selection for reduced dormancy has been illustrated in native warm-season grasses such as switchgrass (*P. virgatum*). Recurrent selection techniques could also be used to develop sources of purpletop with reduced seed dormancy.

Herbicides for Seed Production of 'Highlander' Eastern Gamagrass [*Tripsacum dactyloides* (L.) L.]

Study Number: MSPMC-T-0524-PA
Duration: 2005-2007
Cooperators: John Byrd, Al Rankins – Mississippi State University,
Charles Meister – University of Florida

Introduction:

Highlander eastern gamagrass was released in 2003 to be primarily used as a forage crop (Grabowski et al., 2003). In order to produce sufficient seed for the commercial market, growers need effective herbicide treatments that can be legally applied to the crop. The main focus of this research is to develop herbicide recommendations for seed producers; however, many of the herbicides tested may also have application for establishment of Highlander for forage production and other conservation practices.

There are currently no herbicides that are labeled for eastern gamagrass establishment. Because Highlander will not be grown on large acreages, it is unlikely that chemical companies would be willing to pursue labeling of herbicides for this crop. This makes it an ideal candidate for the IR-4 (Interregional Research Project No.4) program, a cooperative effort between the state agricultural experiment stations, the Cooperative State Research, Education and, and Extension Service, and the USDA, Agricultural Research Service to register pesticides for use on minor crops.

Eastern gamagrass is a close relative of corn, so it likely would be tolerant to many herbicides used for corn production. Eberle et al. (2003) used atrazine on their seed establishment plots and the Jamie L. Whitten PMC has used spring applications of this chemical for many years on both seed production fields and study areas where Highlander was planted. Atrazine has activity against both grasses and broadleaves; however, a single application in the spring only provides a limited period of weed control and control of some problem weeds is poor. It might also have applicability for post-emergence use; however, if used in the spring and later in the season, application rates would need to be adjusted to ensure that maximum application rates per acre are not exceeded. Unfortunately, the manufacturer will not expand the current label on atrazine for any additional crops (Charles Meister, personal communication); however, we will still include it in this study as a standard treatment. Growers may still be able to use it for stand establishment if they establish corn with the eastern gamagrass. Dual™ (metolachlor) and Prowl® (pendimethalin) have been used on some established production fields and on newly-planted fields at the Jamie L Whitten PMC to provide premergence control of grasses; however, further research is needed on all these chemicals to document that they are indeed safe for use at planting and on young stands of Highlander.

Both the Jamie L. Whitten PMC and the PMC in New York have looked at Accent® (nicosulfuron) for post-emergence grass control on established stands of eastern gamagrass. 2,4-D and Aim™ (carfenthrazone) have been used for post-emergence broadleaf control on established Highlander stands at the Jamie L. Whitten PMC and Basagran® (bentazon) has been used for nutsedge (*Cyperus* spp.) control, although it will also control some broadleaves. Tolerance of Highlander to these and other herbicides will also need to be demonstrated before IR-4 clearance can be sought.

Experimental Design:	Randomized Complete Block	
Treatment 1:	Title:	Establishment treatments
	Description:	Apply herbicides at planting
Treatment 2:	Title:	Spring maintenance treatments
	Description:	Apply herbicides on established stands
Treatment 3:	Title:	Post-emergence treatments
	Description:	Apply herbicides on established Stands

Materials and Methods:

The establishment herbicide testing will be conducted in the greenhouse. Herbicides will be applied using a CO_2 plot sprayer (calibrated to 20 gal/ac) to standard bedding plant flats (1020 size) containing field soil planted with 50 stratified seeds of Highlander. Seeds will be planted 0.5 to 0.75 inch deep. There will be an untreated control. Atrazine will be the standard treatment at a rate of 2 lb ai/ac (2 qt/ac). Other herbicides that will be screened are Dual Magnum® at 2 lb ai/ac (2 pt/ac); Prowl® 3.3EC at 1 lb ai/ac (2.4 pt/ac); Axiom® DF at 0.75 lb ai/ac of FOE 5043 and 0.19 lb ai/ac of metribuzin (22 oz Axiom® /ac); Gallery® 75DF (isoxaben) at 0.75 lb ai/ac (1 lb/ac); Karmex® 4L (diuron)at 1 lb ai/ac (2 pts/ac); Barricade® 65WG (prodiamine) at 0.75 lb ai/ac (1.15 lb/ac); Python® WDG (flumetsulam) at 0.80 oz ai/ac (1 oz/ac); and Frontier® 7.5E (dimethamid) at 1.3 lb ai/ac (22 oz/ac). There will be four replications of each treatment. The number of seedlings that emerge and injury ratings will be recorded at weekly intervals. The shoots will be cut at the soil surface and average dry weight per shoot will be determined to evaluate effect of the treatments on plant growth. Any preemergence herbicides that do not damage the germinating Highlander seeds should be safe to use on established stands and could be used for preemergence control of weeds when applied as spring maintenance treatments.

The spring maintenance herbicide testing will be conducted on stands of Highlander located at the MSPMC. A one-year-old stand (planted in 2004 and 2005) and an established stand (planted in 2002, 2003 or 2004) will be treated in March of 2005 and 2006. Plot size will be 5 foot x 8 foot and there will be three replications of each treatment. There will be an untreated control plot. Herbicide treatments will include atrazine 4L at a rate of 2 lb ai/ac (2 qt/ac); Dual Magnum® at 2 lb ai/ac (2 pt/ac); Prowl® 3.3 EC at 1 lb ai/ac (2.4 pt/ac); Karmex® 4L at 1 lb ai/ac (2 pts/ac); and Axiom® DF at 0.75 lb ai/ac of FOE 5043 and 0.19 lb ai/ac of metribuzin (22 oz. Axiom® /ac). All field herbicide treatments will be applied using the CO_2 plot sprayer as described above. Injury ratings will be taken at 7, 14, 21, and 28 days after treatment. Seed heads will be harvested from the treated area in approximately mid-July, the seeds removed, and weighed to determine if there are any adverse effects of the herbicides on seed production.

The post-emergence testing will be conducted on stands of Highlander located at the MSPMC. A one-year-old stand (planted in 2004 and 2005) and an established stand (planted in 2002, 2003 or 2004) will be treated in May of 2005 and 2006. Plot size will be 5 foot x 8 foot and there will be three replications of each treatment. Atrazine will be applied at 2 lb ai/ac (2 qt/ac) Other herbicides to be tested are: Aim™ 2EC at 0.008 lb ai/ac (0.51 oz/ac) plus nonionic surfactant (0.25% v/v); Clarity 4SL® (dicamba) at 0.25 lb ai/ac (0.5 pt/ac); Permit® 75DF (halosulfuron) at 0.047 lb ai/ac (1 oz/ac) plus crop oil concentrate (1.0% v/v); Accent® 75DF at 0.5 oz ai/ac (0.67 oz/ac) plus crop oil concentrate (1.0% v/v); Evik® 80DF (ametryn) at 1.6 lb ai/ac (2 lb/ac) plus nonionic surfactant (0.25%v/v), and 2,4-D Amine 4L at 1.0 lb ai/ac (2 pt/ac). The crop oil concentrate will be at least 80% active and the nonionic surfactant will be 80% active. There will also be a control plot for comparison purposes. Injury ratings will be taken at 7, 14, 21, and 28 days after treatment. Seed heads will be harvested from the treated area in approximately mid-July, the seeds removed, and weighed to determine if there are any adverse effects of the herbicides on seed production.

Evaluation of Little Bluestem [*Schizachyrium scoparium* (Michx.) Nash] Ecotypes for Reduced Seed Dormancy

Study Number: MSPMC-P-0208-WL
Duration: 2002-2006
Cooperators: Brian Baldwin and Paul Meints, Mississippi State University

Introduction:

There are few cultivars of little bluestem [*Schizachyrium scoparium* (Michx.) Nash] that are adapted to the PMC service area, especially for the southern reaches of the area, and seed is difficult to obtain from commercial sources. With the growing emphasis on planting native warm-season grasses in many farm programs for erosion control and wildlife habitat, cultivar development is a priority. Seed dormancy is a major factor affecting field establishment of little bluestem. Selection for reduced dormancy has been illustrated in native grasses such as switchgrass and green needlegrass [*Nassella viridula* (Trin.) Barkworth].

Determining Tolerance of Partridge Pea[*Chamaecrista fasciculata* (Michx.) Greene] and Trailing Wildbean [*Strophostyles helvola* (L.) Elliot] to Preemergence Herbicides

Study Number: MSPMC-T-0309-WL
Duration: 2003-2007

Introduction:

Lark Selection partridge pea [*Chamaecrista fasciculata* (Michx.) Greene] and Hopefield Selection trailing wildbean [*Strophostyles helvola* (L.) Elliot] are two native legumes that were released by the Jamie L. Whitten PMC primarily for wildlife habitat improvement. Both species are annuals and do not set seed until fall. Due to the long growing season of these species, weed competition is a problem in PMC production fields. Also, both species are recommended for use in field borders, where they have a high likelihood of being exposed to herbicides sprayed on the adjacent crop. For these reasons, tolerance of these two species to commonly used herbicides needs to be assessed. Previous research has demonstrated the tolerance of these species to several post-emergence herbicides that are recommended locally for soybean production. Both species tolerate Dual™ (metolachlor) for preemergence applications; however, this herbicide provides poor control of many problem weeds such as morning-glories. The tolerance of Lark Selection and Hopefield Selection to additional preemergence herbicides used primarily on soybeans will be determined in this study.

Establishing Chiwapa Japanese Millet [*Echinochloa esculenta* (A. Braun) H. Scholz] in Group IV Soybeans for Waterfowl Habitat

Study Number: MSPMC-T-0410-WL
Duration: 2004-2006
Cooperator: Kevin Nelms, Area Biologist, NRCS, Greenwood, MS

Introduction:

Many growers in the Mid-South have installed water-control structures to allow retention of water on their fields in the winter months to provide habitat for wildlife (Conservation Practice 644). Waterfowl utilized wasted seed from the agronomic crops in addition to weed seeds and other plant parts as their winter food source. However, research by wildlife biologists has shown that seeds of agronomic crops degrade quickly under flooded conditions. Also, the widespread use of Roundup-ready crops in the past decade has severely impacted the number of weeds that are present in the fields to produce seeds or provide other plant parts for food. To ameliorate these circumstances, some growers plant a late-season crop after they harvest their agronomic crops specifically to provide a food source for waterfowl. One popular crop for this use is a 90-day seed-ripening millet. However, in most years, it is difficult to get the millet established due to lack of rainfall in the late summer after the agronomic crop is harvested.

In 1965, the PMC released 'Chiwapa' Japanese millet [*Echinochloa esculenta* (A. Braun) H. Scholz], which is a 120-day millet. In the past, it has not used as extensively as the shorter-season millet cultivars. However, we realized that it might be possible to seed this millet into an established agronomic crop in the mid-summer, when rainfall and overall soil moisture are better. The seeds could be flown on the fields and would germinate and remain as small plants under the canopy of the agronomic crop until harvest allowed more light penetration for growth. Because this plant is an annual, it would make every attempt to produce seed before frost. We began a study to demonstrate the potential of this approach in producer's fields planted with Group IV soybeans in the Delta (Bolivar, Sunflower, Tallahatchie, and Quitman Counties). June 15, July 15, and August 15 were chosen as target planting dates to use for the initial demonstrations.

Sunflower (*Helianthus annuus* L.) Variety and Herbicide Test

Study Number: MSPMC-P-0118-CP
Duration: 2004-2006
Cooperator: Kevin Nelms, Area Biologist, NRCS, Greenwood, MS

Introduction:

The mourning dove (*Zenaida macroura* Linnaeus) is the most hunted game bird in the Southeast and very popular in Mississippi. Landowners commonly plant fields specifically to attract doves for harvest. Sunflowers (*Helianthus annuus* L.) are frequently planted for dove.

Wildlife biologists frequently recommend planting "peredovick" variety of sunflowers based on a 1980 U.S. Fish and Wildlife study of bird food preferences. Dove and many other species of wild birds showed a preference for black oil-type sunflowers. Peredovick was the best known variety of black oil sunflowers for use in the Southeast. However, the oil crop growth of sunflower in the U.S. has resulted in increased varieties available for southern use. These varieties need to be tested for use in Mississippi and compared to peredovick performance.

Doves are not strong scratchers and rarely perch on seed heads to feed. Therefore, seed must be available on relatively clean, open ground. Many sunflower fields become unattractive to dove due to weed pressure. Historically, very few herbicides were labeled for use on sunflowers and weed control recommendations were not complete. Again, due to increased cropping of sunflowers, new herbicides have recently been labeled for use. In addition, genetically modified herbicide resistant varieties of sunflower are now being marketed. Herbicide efficacy needs to be evaluated due to large price differences and unfamiliarity of new herbicide performances in Mississippi. The study will result in development of a sunflower dove field system best suited to Mississippi. This system can then be confidently recommended to landowners by NRCS personnel.

Materials and Methods:

Variety plots will be 10’ by 40’ with 3 replicates in a randomized complete block. Eight to twelve varieties will be selected for the study based on possible southern performance. Plots will be planted at a rate of 2 seeds per foot on 30” rows using a no-till planter. Plots will be planted in mid-April. Plots will be fertilized with 50 lbs/acre N at planting and 50 lbs/acre N at 3-4 weeks after germination.

Remainder of test fields will be planted using the same equipment, rates, and dates. Herbicide evaluations will be randomly arranged in this field and marked using flags and GPS. Herbicide treatments will be applied using a boom sprayer. Treatments will consist of an untreated control, preemerge of metolachlor (Dual Magnum®) at 1.33 pts./acre and sulfentrazone (Spartan®) at 4 oz./acre and postemerge of clethodim (Select® 2 EC) at 8 oz./acre, preemerge of metolachlor (Dual Magnum®) at 1.33 pts./acre and postemerge of imazamox (Beyond®) at 5 oz./acre. When needed, treatments will be incorporated by rainfall.