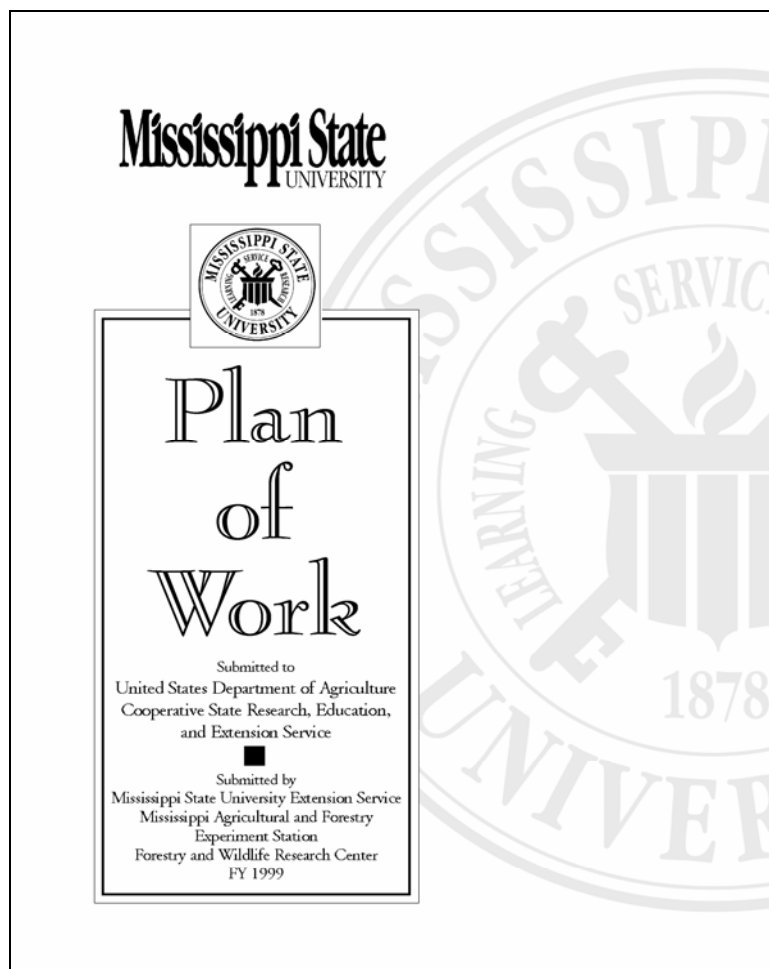


FY 2004 Annual Report of Accomplishments and Results

Submitted to

**United States Department of Agriculture
Cooperative State Research, Education, and Extension Service**



Joint Report

**Mississippi State University Extension Service
Mississippi Agricultural and Forestry Experiment Station**

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A. Planned Programs

Mississippi State University, including the Mississippi State University Extension Service (MSU-ES), the Mississippi Agricultural and Forestry Experiment Station (MAFES), and the Forest and Wildlife Research Center (FWRC), responded to the AREERA Plan of Work requirements by restructuring its program planning process. Based on clientele and reporting needs at the state and local levels, 26 priority program areas (PPA) were established. Based on this new system, outputs and outcomes were determined. The outcomes were primarily intermediate and long-term outcomes, with the first year devoted to establishing the research and extension programs and establishing baselines for future measurement of outcomes. Short-, intermediate-, and long-term outcomes, outputs, and impacts from programs established before AREERA are summarized under each goal below.

**Goal 1: An agricultural system that is highly competitive in
the global economy.**

Overview

The following programs are included under goal 1. Each PPA is given with the specific programs in parentheses after the PPA.

- PPA: Beef & Forage (Alternative Marketing; Forage Improvement; Genetic Improvement; Herd Health; and Nutrition)
- PPA: Catfish (Processing Technology; Fish Behavior; Fish Health; Harvest Technology; Nutrition; and Water Quality)
- PPA: Corn (New Technologies; Planting and Establishment Systems; and Profitability of Cropping Systems)
- PPA: Cotton (Best Management Practices; Conservation Tillage; Disease and Nematode Management; Harvesting, Handling and Ginning; Variety Evaluation and Selection; Weed Control; Crop Price Rations and Risk Management; Irrigation; and Utilizing GIS/GPS in Production)
- PPA: Dairy (Cost of Production; Facility Management; Mastitis Control; Nutrition; and Reproductive Management)
- PPA: Forestry (Forest Resources Management and Use)
- PPA: Horticulture (Horticultural Crops)
- PPA: Poultry and Products (Reducing Malodor and Pathogens; Lipoproteins and Egg Mycoplasma; Fertility in Broiler Breeders; Access to Technical Information; Cocci Vaccine Development; and Poultry Waste Management)
- PPA: Rice (Insect Control; Management and Control of Diseases; Genetics, Breeding and Variety Development; Soil Fertility; and Weed Control)
- PPA: Soybeans (Best Management Practices; Irrigation and Drainage Practices; Planting Dates and Variety Selection; Site Specific Soybean Management; Weed Control)
- PPA: Swine (Technologies and Management)
- PPA: Wildlife & Fisheries (National Catfish Information Database)

Outputs--research and extension activities--under this goal are provided in the table below.

Priority Program Area (PPA)	Refereed Articles	MAFES Pubs.	Extension Pubs.	Extension Contacts	Other
Beef and Forage	20	2	10	199,277	
Catfish	24			7,111	
Corn	26	2		71,803	
Cotton	64	6		77,607	
Dairy				10,370	
Forestry	8		2	121,011	
Horticulture	54	3	22	226,967	
Poultry and Products	49	1	4	6,282	
Rice	25	4	1	15,216	
Soybeans	28	4	1	49,210	
Swine	5		1	4,632	
Wildlife and Fisheries			1	100	

Overall Expenditures for Goal 1

Function	FTE	Expenditures*
Experiment Station	62.93	\$24,192,321
Extension Service	87.15	\$3,327,463

* Expenditures reflect federal and matching funds.

Progress toward intermediate- and long-term outcomes and impacts/outcomes for ongoing programs are documented under the key themes in the next section.

Key Themes

Key Theme – Aquaculture

a. Channel catfish hatcheries have always used rotating metal paddles to move water and simulate ideal hatching conditions for eggs. The metal paddles can be dangerous to hatchery workers when their hands are near the rotating paddles. A hatchery in Indianola began using hatching paddles made of thick plastic rather than metal. The paddle is easily fabricated and much safer than the

traditional metal paddles because it can rotate as needed, but be stopped by hand. The hatchery owner agreed to give the information to others in the industry without patents or financial return.

b. Information on construction and use of the plastic paddle has been spread throughout the aquaculture industry in the nation. At least two large commercial hatcheries are already using the new plastic paddle exclusively, and other hatcheries are expected to follow suit. The paddles cost less than \$1 each to replace. There are 103 hatcheries in the industry using an estimated 20,000 paddles.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Animal Production Efficiency

a. Feed accounts for about half the cost of catfish production. Protein is the most expensive nutrient in catfish feeds. Extensive research at the Mississippi State University's National Warmwater Aquaculture Center has examined ways to reduce dietary protein in catfish feeds without affecting fish performance and product quality.

b. Research has shown that dietary protein levels can be reduced from 32 percent to 28 percent without adverse effect on fish growth and production. A 28 percent protein diet could save \$8 to \$10 per ton of feed. The U.S. catfish industry used about 800,000 tons of feed in 2004. If 50 percent of the industry used the lower protein diet, this would net a savings to the industry of \$4 million.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Aquaculture

a. Channel catfish virus is an economically significant disease of commercial catfish production. Better detection methods of the disease in catfish fingerlings were needed for improvement treatments. Mississippi State University researchers developed a sensitive rapid diagnostic test to identify carriers of channel catfish virus. Initially, the test was not sensitive enough, but the sampling methods of assay could be completed in the required time frame. The development of this test was the first step in eliminating CCV from commercial catfish production facilities.

b. Using the test, researchers found that catfish fry are initially somewhat resistant to CCV to a degree correlated to the CCV antibodies of their mother. This information provides important clues to factors that may predispose a population of catfish fry to CCV disease.

c. Hatch Funds (amounts and FTE not available)

d. Research

Key Theme – Animal Production Efficiency

a. Excessive broiler chick mortality during the first seven days of brooding is often a problem throughout the U.S. broiler industry. Young breeder hens 30 weeks of age and younger are often to blame for these small, poor quality chicks. Hens produce as much as 14 percent of their total egg production through 30 weeks of age, so these increases in broiler mortality among young breeders represents a substantial economic loss to the broiler industry. Research by the Mississippi Agricultural and Forestry Experiment Station indicates these birds may be experiencing problems with increased metabolic gluconeogenesis. Results indicate that adding gluconeogenic substances may improve growth in chicks from 29-week-old parents, and measures taken to reduce the chicks' demand for metabolic gluconeogenesis may improve their performance.

b. Understanding and alleviating early chick mortality by as little as 1 percent could significantly increase profits to the commercial broiler industry. Measures described in this research could significantly increase profits to the more than \$20 million commercial broiler industry.

c. Hatch Funds (amounts and FTE not available)

d. Research

Key Theme – Plant Production Efficiency

a. Low cotton prices and high production costs have triggered interest in alternative cotton production systems in Mississippi with the predominate goal of increasing returns. Fewer linear feet of row per acre suggests potential savings in seed, chemical and harvest costs and increased returns if yields can be maintained near that achieved on a solid planted basis. Mississippi Agricultural and Forestry Experiment Station research compared cotton production on six different row patterns using two varieties over three years.

b. Results show that wide-row cotton production offers reduced down-the-row inputs with equal or greater yields than other production systems currently being used in the Mississippi Delta.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Cotton plants require a lot of moisture during the growing season to produce their yield. For many years, Delta farmers on deep silt loam have used deep tillage, which breaks up compacted zones, allowing greater root and water penetration in the soil with winter and summer rainfall.

Irrigation alleviates drought by adding moisture during the growing season. Mississippi State University conducted an eight-year study of the interaction between deep tillage and sprinkler irrigation in the Mississippi Delta on deep silt loam. Yield responses and economic implications of these practices were determined. Results indicated that to obtain maximum yields on this soil, producers should either subsoil or irrigate, but not both.

b. The adoption of this research could benefit producers through a combination of lowered production costs and increased yields for an average profit of \$40 an acre. More than half of the Delta's .8 million acres are irrigated.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Mississippi producers have switched to an early-planted soybean system and have significantly increased yields. Soybeans grown under this system mature under conditions favorable for late season foliar diseases, which can cause yield losses and damage seed quality. The Mississippi Agricultural and Forestry Experiment Station conducted trials of early-planted soybeans on producer fields in 2003 and 2004. Diseases present on the soybeans were identified and disease ratings were made throughout the season. Yields, seed quality and fungi in the seed were determined at harvest.

b. Researchers found five diseases to offer the most threat, and identified the most effective fungicides for treatment. Application of these fungicides increased yields by an average of five bushels an acre, and seed quality was higher in the treated than the untreated fields. Treatments cost \$12.50 an acre, but at \$5 a bushel, the increased yield brought in \$25, of which half was profit.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Competitiveness

a. The intent of forest certification is to produce forest products in an economically, ecologically and socially sustainable manner. Major retailers are stocking certified products and demand for this emerging market is increasing. Private landowners need up-to-date information to take advantage of this market. The forest industry or governments own the bulk of forestland currently certified, and in the South, most forestland is privately owned. Pine trees planted today will be harvested in 15 years, so if Mississippi forest owners hope to one day offer certified forest products, they must start soon.

b. Mississippi State University and Louisiana State University developed a project to assess market

demand for certified products, determine landowner understanding of the process and conduct forest certification workshops in both states. Results should help landowners make informed decisions about forest certification and how to accomplish it.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Invasive Species

a. Invasive plant species of water and land are a national problem costing billions of dollars in lost productivity and management costs. Invasive species directly impact row crop agriculture, pastureland, timberland, roadsides, wetlands and waterways. Invasive plants are found in every habitat in Mississippi, but aquatic invasives are of particular interest. Working with the U.S. Geological Survey, Mississippi State University's GeoResources Institute developed an integrated research program for aquatic and terrestrial invasive plants. Alliances have been formed, monitoring and research programs coordinated and information exchanged.

b. The goal of these invasive species alliances is to increase the efficiency of invasive species management and to increase allocations for managing invasive species in Mississippi. Cost of problem invasive species is estimated at more than \$137 billion a year nationwide, with invasive plants costing \$40 billion of this.

c. Hatch Funds (amounts and FTE not available)

d. Research

Key Theme – Animal Health

a. Cattle grazing endophyte-infected tall fescue have reduced reproductive efficiency, lower calf weaning weights, reduced overall health and lower feedlot gains, among other problems. Diseased fescue cost the cattle industry millions of dollars each year. Fungus-free fescue varieties have been found that virtually eliminate these production problems, but the plants do not graze well and must be replanted annually. A new novel fescue was created by genetic insertion technology that provides the production potential of a fungus-free fescue and is hardy. It is being evaluated to determine its persistence, management and grazing practices necessary for persistence, and whether it provides acceptable animal weight gains and more.

b. Utilization of this forage has the potential to reduce production costs from the cow-calf producer through the feedlot phase and provide a less expensive, higher quality product. The production potential of these novel endophyte forages may revolutionize the Southern animal industry. The problems presented by the infected endophyte will be eliminated and save the industry millions of dollars in production losses, which translates into a more economical meat product for the American public.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Profitability

a. Farm-raised catfish is one of the most popular seafoods in the United States, and one of its most important market attributes is consistent flavor. Producers constantly fight against catfish developing off-flavors that are unacceptable to consumers. Odorous, non-toxic chemicals produced in ponds by algae are responsible for these off-flavors. The off-flavor disappears in time when market-ready fish are held in inventory. Lost production time costs catfish farmers \$15 million to \$75 million a year. Mississippi State University scientists at the National Warmwater Aquaculture Center in Stoneville developed simple treatments for algae-related off-flavors. These treatments use copper sulfate and diuron, both safe and inexpensive algicides.

b. These treatments have been widely adopted by the catfish industry and reduce the incidence of undesirable flavors by more than 50 percent. They have a benefit to cost ratio of 40:1.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Fish producers commonly fertilize nursery ponds to stimulate the growth of oxygen-producing algae and to develop fish. Those fertilization practices commonly used for Mississippi catfish nursery ponds were developed 40 years ago in Alabama, and have not been studied in the Mississippi Delta. Mississippi leads the nation in catfish production. Mississippi Agricultural and Forestry Experiment Station researchers evaluated the phytoplankton and zooplankton response to fertilization in channel catfish nursery ponds. They found that ponds responded more to nitrogen than to phosphorus additions, and increasing the nitrogen application had better results.

b. Based on these studies, the recommended fertilization practices for Mississippi Delta catfish ponds were changed. Dramatically changing previous pond fertilization methods can increase the densities of important zooplankton and should improve fry growth, survival and health.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Precision Agriculture

a. Precision farming uses new technologies to identify and measure within-field variability and its causes, prescribe site-specific input applications that match varying crop and soil needs, and apply inputs as prescribed. Inputs are made more efficient by proper timing and precise application. The Mississippi Agricultural and Forestry Experiment Station worked with USDA-ARS to test, verify and further develop farm-level precision agriculture technologies for cotton. Commercial yield monitors had not been in available previously to make such studies possible. A private, 33-acre farm was used for the 2001-2003 growing seasons.

b. Seed, insecticide, plant growth regulator and interest costs were reduced each year, but fertilizer costs rose every time. Total average per-year savings was \$1.71 per acre. Implementing precision agriculture on farms of 750 acres or more costs about \$10 an acre, but the percentage yield increases shown under precision farming are well more than enough to cover these costs.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Before early planting of soybeans became a widely accepted practice, producers had protocols in place to control weeds. With early planting systems, soybeans are now ready for harvest when weeds are still emerging. The majority of the state's soybeans are early planted, so solutions must be found for weed control problems. Researchers at the Mississippi Agricultural and Forestry Experiment Station began investigating the use of residual herbicides in various stages of the soybean production process. They evaluated them as tank mix partners with glyphosate to improve the control of annual grasses at harvest in early-maturing soybeans.

b. Using residual grass herbicides in conjunction with glyphosate has consistently reduced the need for sequential glyphosate applications in early-maturing soybeans and reduced grass pressure at harvest. Adopting the use of this practice will improve farm efficiency and reduce the use of pre-harvest desiccants.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Hay is one of the most expensive feeds most producers provide for beef cattle. Costs include production of the bale, protected storage or loss due to unprotected storage and animal waste. Feeding round bales in rings reduces some feeding loss, but it still creates a disturbed area that must be renovated or it will be weedy and unproductive for two to three years. Mississippi Agricultural and Forestry Experiment Station researchers studied the use of a round bale feeder and its impact on feed utilization. Round bales were fed with and without rings and with a bale distributor. Feeding

areas were evaluated and renovated, and costs of renovation calculated. Machinery, labor, seed and weed control added up to \$1.76 per bale.

b. Researchers achieved \$3.76 in savings per bale by eliminating 10 percent hay losses in a bale that costs about \$20 to produce and the \$1.76 renovation costs. This reduction in production costs makes beef cattle production more efficient. Eliminating the need for renovation also reduces soil loss to erosion.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Genetic improvements in growth rate and feed conversion have allowed broiler companies to meet the demand for chicken meat consumption in the United States. However, as commercial broilers are improved and therefore marketed at heavier weights earlier in life, it is clear that nutritional programs in broilers need to be modified. Mississippi State University poultry science researchers conducted a series of nutrient density research trials and noted improvements in income over feed costs up to 15 cents per bird.

b. This improved profit margin could result in an increased income of \$7.8 million for a 1 million-bird complex per year. Assuming Mississippi's broiler companies produce 800 million birds annually, the increase in income would be \$120 million.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Innovative Farming Techniques

a. Inefficient harvesting costs the catfish industry at least \$50 million annually. Mississippi State University scientists determined using electricity as a means of repelling fish from seines reduces the number of large fish missed during harvest.

b. Harvest trials concluded the average total harvest was 22 percent higher using the electrically enhanced seine. Further research can result in the development of a commercial electrically enhanced seine, which will improve the profitability of catfish producers.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Profitability

- a. More comprehensive outreach efforts are needed to reach the nearly 75 percent of Mid-South forest landowners who fail to take advantage of available educational and professional resources. Landowners with small- to mid-sized tracts in particular often lack knowledge and training, making their lands less productive and more often neglected. A recent survey by Mississippi State University's Forest and Wildlife Research Center focused on individuals owning 10 or more acres of forestland in Arkansas, Louisiana, Mississippi and Tennessee. Researchers identified as underserved all those individuals whose responses indicated they do not consult with a professional forester, use forestry-related educational programs or were not members of a forestry-related organization.
- b. Knowing the needs of underserved landowners can help forestry educators and organizations direct outreach efforts to education on federal and state government assistance programs, tax incentives for forest landowners, benefits of consulting with a professional forester and availability of forestry-related educational programming. This will result in improved forestry practices and enhanced economic viability of the lands.
- c. Hatch and Smith-Lever Funds (amounts and FTE not available)
- d. Integrated Research and Extension

Key Theme – Agricultural Profitability

- a. Cotton producers need harvesting equipment that will reduce the cost of harvesting a crop in order to ensure growing cotton in the South remains economically viable. Mississippi State University agriculture economics research was performed on the specifications and economic advantages of a picker with an onboard module builder that compresses the cotton into units that can be hauled in conventional module-hauling trucks.
- b. The research showed that this new machine would make cotton harvesting a one-person operation, dramatically impacting the organizational structure of cotton farms today. Using this equipment will result in a 26 percent savings in direct costs and a little over 18 percent savings in total costs. The equipment is expected to be on the market for the 2006 harvest.
- c. Hatch and Smith-Lever Funds (amounts and FTE not available)
- d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

- a. Natural regeneration of oaks is a central focus of hardwood management in the South. Researchers lacked information on how to create optimal light conditions for oak seedlings, which is a major factor in ensuring successful oak regeneration. Scientists in the Mississippi State

University Department of Forestry conducted research on oak regeneration and found how to create the optimal sunlight percent range for oak seedlings.

b. Hardwood land managers now have operational guidelines for creating conditions favorable for the establishment and development of oak seedlings in bottomland areas.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Health

a. Economic losses caused by soybean rust are estimated to be as much as \$1.3 billion during the first year and up to \$2 billion in ensuing years. This situation affects soybean producers, the agricultural industry and the American economy. Mississippi State University researchers are examining the social organizational structures -- legal authority, chain of command, division of labor, location of treatment stockpiles, and pre-event coordination between local, state and national agencies -- that need to be modified to enhance responses to soybean rust threats.

b. Successful development of a response plan will provide economic and social benefits by reducing damages and threats of the soybean pathogen. This also could improve the environment by limiting impacts of an invasive species. If successful, the social organizational structure developed to combat soybean rust also could be applied to bio-threats to other commodity crops.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Competitiveness

a. Producers needed assistance understanding their rights under the Trade Adjustment Assistance program, which provides financial assistance to agricultural producers negatively affected by import competition. Three Mississippi State University Extension Service researchers developed and wrote a comprehensive, interdisciplinary set of technical assistance materials for training catfish producers in an 18-state area on a variety of topics related to production and financial management in their operations. This team of researchers was primarily responsible for delivering the TAA catfish program to producers in Mississippi.

b. In Mississippi, 35 percent of catfish producers signed up for TAA. The core team coordinated and presented technical trainings to 82 percent of these applicants. Fifty-seven percent of applicants received payments totaling \$260,445, or an average of \$3,028 per successful applicant. In 2004, the TAA program paid out over \$500,000 to more than 200 catfish producers in all 18 affected states.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. The heat of Mississippi summers presents heat stress issues to dairy farmers trying to keep their cows cool enough to produce abundant milk. Mississippi Agricultural and Forestry Experiment Station researchers conducted a 10-week study on a tunnel-ventilated barn housing dairy cows and compared the results to cows housed in a traditional barn.

b. Cows housed in the tunnel barn consumed 4 pounds more feed per cow per day and produced an average of nearly 6 more pounds of milk per day per cow, indicating a significant impact on milk production in the summer months on dairies in the southeastern United States.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Producers who grow cotton, corn, and soybeans in monoculture have seen yield declines as a result of insects, diseases, parasitic nematodes, weeds, and fertility problems associated with producing the single crop. A Mississippi State University Extension Service agent encouraged 12 monoculture producers to convert to crop-rotation programs through demonstrations and case studies of producers who had successfully used crop rotation practices.

b. Of the 12 monoculture producers, four converted to some form of crop rotation. All four experienced increased yields as a result of this change. One producer who had been growing only cotton for more than 35 years planted 250 acres of corn, which was approximately 20 percent of his farm. It yielded about 180 bushels per acre (non-irrigated); about 50 bushels above the state average. He plans to expand the rotation to take in one-third of his annual crop acreage.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Profitability

a. Above-normal rainfall and constant cloudy weather can cause nitrogen loss and reduce yields for cotton growers. Problems from over-fertilization can include production of excessive vegetation, reduction in fruit retention, increase in insect populations, and crop termination and defoliation. Mississippi State University Extension Service agents monitored three cotton fields affected by excessive rainfall to determine if additional nitrogen applications were necessary. They compared

root health and development, growth, fruit retention and node above white flower measurements with “normal” plants.

b. Plants in the fields were developing at the same rates as the normal fields, and only one field needed additional nitrogen application. This field was late-planted cotton with slower development. Approximately 1,500 acres did not need additional nitrogen at a savings of \$10 per acre, or a total savings of \$15,000.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Competitiveness

a. Forest landowners in western Hinds County saw a discrepancy in the quality of their land and the taxes they owed. The land in question was poor in quality and very hilly, but it was classified as type A forestland, the highest forest use value. Surrounding soils, including some more productive, were classified as type B or type C and were taxed less. Mississippi State University Extension Service agents reviewed the soil classifications and inspected the timber in these poor soils. They found that the Hinds County Soil Survey did not factor in the slope and erosion class for some soils in the hilly area west of Utica. This led to some soils in these hills to be overvalued as forestland.

b. The Mississippi State Extension Service held a meeting with the Mississippi Tax Commission and Mississippi State University’s Forestry and Economics Department to explain the error in the soil survey and gain approval to correct the error. The MS Tax Commission agreed with some of the changes recommended. Valuation for one soil association of 25,000 acres was changed for 2005 taxes. The ad valorem taxes for these landowners were essentially cut in half, saving them \$100,000 per year.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Corn producers need to consider variety selection to obtain maximum productivity and profit from their crop. Reality Partners, a corn producer in Stoneville, Miss., consulted Mississippi State University Extension Service agents for assistance in selecting the best corn varieties for their soil makeup and irrigation situation.

b. Reality Partners averaged 200 bushels per acre on their farm, up from 190 bushels per acre last year. The increase in yield resulted in a profit increase of \$2.50 per bushel, for a total increase in profit of \$3,750 for 1,500 acres. The corn variety used on four of Reality Partners’ fields won the National Corn Growers Yield Contest for Mississippi Growers.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Agricultural Profitability

a. Timber tax education allows forest landowners to benefit by reducing the tax burden and increasing profitability. Two Mississippi State University Extension Service professors authored an article entitled “Quick Tips for Timber Tax,” which was published in *Tree Talk Magazine* and was also distributed to 2,700 Mississippi Forestry Association members.

b. Twenty tax inquiries were made to the Extension Forestry Department following the publication of the article. A follow-up Timber Tax Short Course was held in Leake County to further address the issues presented in the article, and 31 forest landowners, holding a total of 7,150 acres attended. It is estimated that by using the tax information presented, these landowners saved a total of about \$106,750 on their timber taxes. Due to the publicity of the article, the Mississippi Forestry Association requested MSU Forestry Extension present a special one-day tax seminar for the Mississippi Forestry Association Annual Meeting.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Small Farm Viability

a. Lamar County landowners reuse valuable land by planting pines in old agricultural fields and pastures each year. But in the spring and summer following treatment, these plantings face grass and broadleaf weed competition, which was especially severe in 2004 due to excessive rainfall. Commercial aerial pesticide applicators can be costly and difficult to secure on short notice to treat smaller tracts, so the landowners needed a less-expensive treatment to eliminate the weeds. Mississippi State University’s Extension Service assisted two producers with two plantings covering 130 acres. Extension workers set up sprayers to properly apply a 4-foot-wide band of herbicide to each row of the plantings. They helped landowners calibrate their sprayers and select the correct herbicide and rate of application.

b. The weeds were effectively controlled, keeping them from destroying the pine stand on both tracts of land. One tract was longleaf pine with a total establishment cost of \$3,450 for 30 acres. The other tract was loblolly pine with a total establishment cost of \$7,000 for 100 acres. It cost each producer less than \$10 per acre to treat with herbicide, while a commercial applicator would have charged \$40-\$100 per acre for the same treatment. The producers saved a total of \$3,900 by treating the tracts themselves.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Goal 2: A safe and secure food and fiber system.

Overview

The following programs are included under goal 2. Each PPA is given with the specific programs in parentheses after the PPA.

- PPA: Catfish (Food Quality and Safety)
- PPA: Food Safety (Food Safety)

Outputs--research and extension activities--under this goal are provided in the table below.

Priority Program Area (PPA)	Refereed Articles	MAFES Pubs.	Extension Pubs.	Extension Contacts	Other
Catfish	8	1		245	
Food Safety				39,571	

Overall Expenditures for Goal 2

Function	FTE	Expenditures*
Experiment Station	3.07	\$974,784
Extension Service	4.30	\$147,573

* Expenditures reflect federal and matching funds.

Progress toward intermediate- and long-term outcomes and impacts/outcomes for ongoing programs are documented under the key themes in the next section.

Key Themes

Key Theme – Food Handling

a. Processing methods must be studied constantly to assure maximum profits for production. Mississippi State University agriculture economists continued to evaluate the production parameters for the fingerling to stocker phase in a modular catfish production system.

b. The economic analysis showed the modular system has a cost of production similar to that of traditional multiple batch catfish production systems, but the non-cash benefits of the modular system make it preferable. The modular system's benefits include larger fish product to meet processor demands, lower final stocking rate, less water quality problems, larger stockers for producer and improved control over inventory.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Food Resource Management

a. Producers of freshwater prawns, a new shellfish product, need to know consumer attitudes toward their product to determine how best to market and sell them. Mississippi State University agriculture economists mailed surveys to a large, urban area and a rural area. The survey results revealed a high potential for consumers' acceptance of freshwater prawns, willing-to-pay prices similar to prices for marine shrimp and a positive consumer attitude toward farm-raised prawn products.

b. Producers now have a better idea of consumer acceptance of freshwater prawns and how to market this product.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Food Safety

a. Diseases like salmonella and campylobacter in poultry threaten the health of people and reduce the profitability of producers. Veterinary researchers at MSU's College of Veterinary Medicine converted a camper trailer into a mobile food safety lab that they use to collect samples from poultry farms across Mississippi and three other states. Researchers evaluate bacterial levels for each flock at four stages in the production process to best determine where to concentrate treatment efforts.

b. When a primary point of contamination is identified, researchers can focus on that area to reduce the risk of diseases, which will help the poultry industry continue to meet food safety standards and produce a good quality product.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Food Security

a. A sustainable and competitive Mississippi rice industry in an environment of rising production costs and troublesome pest problems is dependent on developing productive and pest-resistant cultivars. Mississippi State University researchers are evaluating promising rice cultivars that

combine high grain and milling yields with disease tolerance.

b. The improved rice cultivar offers producers increased production efficiency and less dependence on costly pesticide applications. These features enhance the sustainability of the producer in an increasingly competitive environment while providing the consumer a wholesome and affordable product.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Goal 3: A healthy, well-nourished population.

Overview

The following programs are included under goal 3. Each PPA is given with the specific programs in parentheses after the PPA.

- PPA: Human Health (Family Health Needs; Improved Access to Health Care Services; Life Skills and Healthy Habits in Young People; Utilization of Available Medical Care)
- PPA: Human Nutrition (Health and Nutrition)

Outputs--research and extension activities--under this goal are provided in the table below.

Priority Program Area (PPA)	Refereed Articles	MAFES Pubs.	Extension Pubs.	Extension Contacts	Other
Human Health			1	143,125	
Human Nutrition			4	586,333	

Overall Expenditures for Goal 3

Function	FTE	Expenditures*
Experiment Station	1.73	\$357,767
Extension Service	74.60	\$1,465,305

* Expenditures reflect federal and matching funds.

Progress toward intermediate- and long-term outcomes and impacts/outcomes for ongoing programs are documented under the key themes in the next section.

Key Themes

Key Theme – Human Nutrition

a. Prevalence of overweight in children across the country is reaching alarming proportions, and Mississippi’s prevalence of overweight children is one of the highest. A team of experts at Mississippi State University conducted preliminary research in preparation to implement a coordinated school health program called CATCH, or Coordinated Approach To Child Health, which focuses on health and physical education; school health, nutrition, counseling and social services; healthy school environment; school-site health promotion for staff; and family and community involvement. Anthropometric measurements of children and teachers/staff were

collected to establish a baseline, and surveys/focus groups with parents were conducted to assess attitudes and barriers related to childhood overweight.

b. The pilot school in Starkville will serve as a model for coordinated school health programs in Mississippi, which ultimately could reduce the incidence of obesity and related health problems.

c. Smith-Lever Funds (amounts and FTE not available)

d. Multi-State Extension

Key Theme – Human Health

a. Breast cancer is the most common type of cancer in women, with approximately one in nine women developing the disease in her lifetime. Early detection is key to treating this devastating disease. The Mississippi State University Extension Service in Winston County partners with the Mississippi Academy of Family Physicians Alliance and the Winston County Medical Center to provide breast cancer awareness programming that emphasizes the importance of early detection.

b. In the nine years since the program began, the percentage of Winston County women over the age of 65 receiving mammograms rose from 34 to 67. The success of the program motivated other county Extension programs to organize similar efforts.

c. Smith-Lever Funds (amounts and FTE not available)

d. Multi-State Extension

Key Theme – Human Nutrition

a. Many parents of school-age children work outside the home, and these children need after-school supervision as well assistance in choosing nutritious after-school snacks. Mississippi State University Extension Service 4-H agent began an after-school program called the Grenada County 4-H Healthy Hearts Club that focuses on health, nutrition, and fitness.

b. The Healthy Hearts Club meets twice a month, and 27 kids, ages 6-12, attend. The children participate in exercise periods, eat healthy snacks, learn about nutrition, and work on service projects. This keeps the children off the streets and under adult supervision while teaching them about the importance of healthy diet and exercise. Parents report that children are making healthier food choices such as selecting salads at fast food restaurants. The children are losing weight and are educating their parents as well.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Human Nutrition

a. Mississippi is recognized as the “fattest state in the nation,” and the health risks associated with obesity are great. The Mississippi State University Extension Service in Clay County organized a community weight-loss and health improvement challenge that encouraged teams of 10 people to lose a cumulative 100 pounds during a 12-week period.

b. Instead of the expected 220 participants, more than 1,200 residents enrolled in the program and lost a total of nearly 6,000 pounds. Weekly educational sessions offered information on the importance of exercise, portion control, healthy eating and the reduction of sweets and fats. The success of this program prompted Extension offices in nearly all Mississippi counties to offer similar programs in 2005.

c. Smith-Lever Funds (amounts and FTE not available)

d. Multi-State Extension

Goal 4: An agricultural system which protects natural resources and the environment.

Overview

The following programs are included under goal 4. Each PPA is given with the specific programs in parentheses after the PPA.

- PPA: Cotton (Insect Management - IPM)
- PPA: Soybeans (Integrated Pest Management)
- PPA: Swine (Waste/Odor Management)
- PPA: Wildlife and Fisheries (Ecology and Management of Sustainable Resources; Ecosystem Management and Restoration)

Outputs--research and extension activities--under this goal are provided in the table below.

Priority Program Area (PPA)	Refereed Articles	MAFES Pubs.	Extension Pubs.	Extension Contacts	Other
Cotton	11			17,209	
Soybeans	4			17,211	
Swine				1,892	
Wildlife and Fisheries				6,072	

Overall Expenditures for Goal 4

Function	FTE	Expenditures*
Experiment Station	13.56	\$4,429,115
Extension Service	11.02	\$578,260

* Expenditures reflect federal and matching funds.

Progress toward intermediate- and long-term outcomes and impacts/outcomes for ongoing programs are documented under the key themes in the next section.

Key Themes

Key Theme – Pesticide Application

a. Mississippi crop producers use glyphosate herbicide to effectively control many kinds of weeds without injury to the target crop plants, but off-target movement caused by conventional spray nozzles wastes the product and also causes injury to neighboring crops. Mississippi State University researchers evaluated the use of newly developed Air Mix spray nozzles and the use of experimental spray additives for reducing herbicidal drift.

b. Results show the fine, driftable spray droplets can be reduced from 49 percent of the spray volume using the conventional spray nozzles to 13 percent using the Air Mix spray nozzles. Studies also showed the use of the experimental spray additives reduced the percent of volume of fine droplets from each nozzle type by an additional 35 percent. These techniques can be used while maintaining the same level of herbicidal performance as obtained with conventional spray applications, and the potential loss of herbicide due to drift can be reduced by 40 percent.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Nutrient Management

a. The Jourdan River watershed is one of Mississippi's most contaminated waterways. Fecal coliform is present in above-acceptable levels, even though cattle numbers in the area have decreased over the past 10 years. While other factors such as increased wildlife numbers also contribute to fecal coliform levels, many livestock producers want to go the extra mile by improving their runoff situations. Mississippi State University's Extension Service presented a Rotational Grazing Field Day for livestock producers in the Jourdan River watershed. Farmers learned how to increase forage production quantity and quality by increasing the number of cross-fences along with other management practices. Simply by increasing the forage, livestock producers are able to provide a better filter for the animal waste that would otherwise run into the water.

b. Over 30 landowners participated in the forage production program. With this number of interested producers, a minimum of 10 percent of the grazing lands in the watershed, or 2,000 acres, will sustain a higher level of runoff filtration. The local feed store in Hancock County has reported that they are now selling electric fencing to producers who have never purchased electric fencing. This is an indication that farmers are cross fencing for rotational grazing, which will lead to more forage and cleaner water.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Nutrient Management

- a. Alcorn County needed a facility where livestock could feed economically by conserving hay, with no detrimental effects to the surrounding environment. With help from the local Natural Resources Conservation Service agent, Mississippi State University and local farmers pursued and were rewarded a grant for the construction of a feeding facility on a local beef cattle farm that would feed about 50 calves.

- b. The facility was constructed in 2004. Feeding hay in this type of facility keeps the animals and hay out of the weather and prevents hay from getting stomped into the ground. This saves 200 pounds of hay per bale at a savings of \$10 per roll of hay. With a feeding of 200 rolls, this is a savings of \$2,000. NRCS studies also show that calves in this feeding scenario had 100 pounds of gain at \$1 per pound for a yield of an additional \$100 per calf, or \$5,000 for the 50 calves fed there. This is a total of \$7,000 increase in profit when combined with hay savings. The concrete pad and drainage system prevent excess runoff and protect nearby water sources from waste.

- c. Hatch and Smith-Lever Funds (amounts and FTE not available)

- d. Integrated Research and Extension

**Goal 5: Enhanced economic opportunity and quality of life
for Americans.**

Overview

The following programs are included under goal 5. Each PPA is given with the specific programs in parentheses after the PPA.

- PPA: Agribusiness (Agribusiness Development)
- PPA: Child/Youth/Families at Risk--CYFAR (Reducing At-Risk Behaviors; Nurturing Families)
- PPA: Consumer Education (Clothing; Housing; Kenaf in Textiles/Textile Products)
- PPA: Economic/Comm Development (Community Leadership Development; Diversifying Rural Economies; Entrepreneurial & Business Development; Strategic Planning by Local Communities; Local Government Officials Education)
- PPA: Financial Management (Family Financial Management; Farm Business Financial Management)
- PPA: Food and Food Products (Business Feasibility; Specialty Foods Business Development)
- PPA: Forest Products (Forest Products)
- PPA: Leadership Development (Volunteers)
- PPA: Safety (AgrAbility; Farm Safety; Youth Safety)
- PPA: Wildlife & Fisheries (Youth Development; Socio-Economic Investigations of Fish and Wildlife)
- PPA: Youth Development (4-H)
- PPA: Youth Livestock (4-H)

Outputs--research and extension activities--under this goal are provided in the table below.

Priority Program Area (PPA)	Refereed Articles	MAFES Pubs.	Extension Pubs.	Extension Contacts	Other
Agribusiness		1		11,312	
Children, Youth and Families at Risk				228,944	
Consumer Education			24	36,364	
Economic/ Community Development			1	152,016	
Financial Management				64,500	
Food and Food Products				1,906	
Forest Products				1,737	
Leadership Development				222,336	

Safety				13,465	
Wildlife and Fisheries			4	45,675	
Youth Development				575,286	
Youth Livestock				181,832	

Overall Expenditures for Goal 5

Function	FTE	Expenditures*
Experiment Station	4.74	\$1,550,636
Extension Service	155.35	\$4,296,172

* Expenditures reflect federal and matching funds.

Progress toward intermediate- and long-term outcomes and impacts/outcomes for ongoing programs are documented under the key themes in the next section.

Key Themes

Key Theme – Children, Youth, and Families at Risk

- a. It is difficult for the Extension Service to reach at-risk families with educational materials they need to learn appropriate parenting skills. The Mississippi State University Extension Service and the Mississippi State Department of Health signed an agreement that will provide Extension training sessions and parenting education publications for health department workers to give their clients.
- b. Health department workers with one-on-one contact with at-risk mothers, children and families will be able to provide educational Extension materials that otherwise would not have reached those in need.
- c. Smith-Lever Funds (amounts and FTE not available)
- d. Multi-State Extension

Key Theme – Farm Safety

- a. People who live and work in agricultural settings can have their livelihood taken away if they become disabled. The MSU Extension Service partners with the MSU T.K. Martin Center for Technology and Disability and the Mississippi Department of Rehabilitation Services to help disabled people modify farm equipment so they can continue working in the agriculture sector.

b. Keeping disabled people in their farm setting is not only good for their self-esteem, but it also allows them to continue providing for their families and for the communities that depend on the agricultural product or service they provide.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Child Care/Dependent Care

a. Because current government regulations permit the educational levels of non-Head Start teachers and assistant teachers to be minimal, a rigorous training system with numerous options for on-the-job educational advancement is critical for improving the quality of educational experiences young children receive prior to school entry and for building the capacity of the early childhood workforce.

Mississippi State University partnered with three Mississippi community colleges and Mississippi Public Broadcasting Authority and Foundation to implement three resource and referral centers, one per campus of each community college. The sites will be training and information centers for the families of children birth to 4 years of age and for their teachers who provide educational programs in a variety of settings.

b. During the first year of program implementation, it is projected that staff and families in nearly 50 percent of both the licensed programs and family childcare homes will benefit from the services. In year two, the number will increase, with the goal of serving 80 percent of the population in the designated counties. Expanded training and educational opportunities for childcare workers will enhance the quality of the current childcare programs in the area.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Youth Development/4-H

a. 4-H and FFA youth devote themselves each year to raising and showing quality livestock with the goal of qualifying for the Dixie National Sale of Junior Champions. Each year, the Mississippi State University Extension Service sponsors the Dixie National Sale of Junior Champions.

b. The 2004 Sale drew more than 60 buyers who paid a record \$197,684 for the 35 champion animals displayed. Youth develop responsibility through caring for and working with their animals, and friendly bidding among buyers drives prices up for the benefit of the youth involved.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

Key Theme – Family Resource Management

- a. High school students must learn how to properly manage money so they will be prepared to make the most of their earnings after graduation. The Mississippi State University Extension Service offers Jump\$tart training seminars to Mississippi high school teachers. Teachers learn to incorporate lessons emphasizing the importance of goal setting, budgeting, saving and other principles of the financial planning process.
- b. Mississippi’s high school seniors answered 53.3 percent of financial questions correctly, compared to a national average of 52.3 percent. Congress now requires that students be offered personal finance classes, and Extension personnel hope those classes eventually will be required.
- c. Smith-Lever Funds (amounts and FTE not available)
- d. Multi-State Extension

Key Theme – Promoting Business Programs

- a. The furniture industries in Mississippi and throughout the South have experienced extreme global pressures, especially from China, where producers currently are shipping a container of furniture to the United States at prices 20 percent to 30 percent lower than the same furniture produced domestically. Scientists in Mississippi State University’s Institute of Furniture Manufacturing and Management are helping furniture companies throughout the south implement lean production, an engineering term for the ability to produce more with less. This allows companies to produce superior quality products on time, with great flexibility and with a high rate of productivity.
- b. In an upholstered furniture manufacturing company, conversion to lean production increased productivity by 36 percent. For another furniture manufacturer, lean conversion increased productivity by 72 percent while decreasing time to manufacture by 33 percent. For a furniture supplier, the results included a 42 percent improvement in productivity, an 83 percent reduction in finished goods inventory and a 78 percent reduction in raw material goods inventory.
- c. Hatch and Smith-Lever Funds (amounts and FTE not available)
- d. Integrated Research and Extension

Key Theme – Child Care/Dependent Care

- a. People who provide home care for fewer than five children in Mississippi have no educational requirements. With an estimated 57 percent of Mississippi’s children receiving care in unlicensed settings, it is vital to provide educational information, programs, resources and support to those providers caring for many of the state’s most vulnerable children. Mississippi State University

Extension Service established the Nurturing Homes Initiative project in 2000 to provide educational information, training and technical assistance to family home providers that offer full-day, full-year child care services to children of families meeting certain income requirements. The project utilizes a nationally recognized rating scale to assess the quality of child care provided. Child care providers also receive intensive technical assistance through the use of a WebTV system, one-on-one demonstrations and a notebook of lessons.

b. For the past four years, the data reveals significant gains in the quality of child care due to intensive and consistent technical assistance to family home providers. The quality of care improved in participating homes, and continued education and support for these providers will increase the quality of care even more.

c. Smith-Lever Funds (amounts and FTE not available)

d. Multi-State Extension

Key Theme – Promoting Business Programs

a. Southern pine supplies 45 percent, or about 17 billion board feet, of the 37 million board feet of lumber produced in the United States each year, but its value is lowered significantly as a result of the warp that occurs during kiln drying. Researchers in Mississippi State University's Department of Forest Products invented the Moisture and Density Detector, a device that detects compression and juvenile wood in green Southern pine lumber during the green sorting process. Once identified, lumber with juvenile and compression wood can be sorted for drying separately by special procedures designed to reduce warp.

b. Identifying lumber that needs special treatment to reduce warp can help salvage most of the \$500 million Southern pine lumber value lost to warp each year.

c. Hatch and Smith-Lever Funds (amounts and FTE not available)

d. Integrated Research and Extension

Key Theme – Child Care/Dependent Care

a. Children who attend daycare for the majority of the day eat meals and snacks provided by their caregivers. It is important that caregivers be knowledgeable of potential allergens in foods so that they will not put children at risk. The Mississippi State University Extension Service held an in-service training for 65 daycare providers in Washington County. Caregivers learned how to keep proper documentation on each child's needs and allergies, how to document any food changes that occur, and how to read food labels.

b. At the beginning of the training only five caregivers passed a test identifying common foods containing ingredients that could cause allergic reactions. At the end of the training 100 percent of

the class passed the test. This training will improve the quality of care provided to Mississippi's children and potentially could be life-saving.

c. Smith-Lever Funds (amounts and FTE not available)

d. Multi-State Extension

Key Theme – Youth Development/4-H

a. Summertime presents concerns for local housing authorities because many children whose parents work outside the home have no supervision or organized activity during the day. Mississippi State University Extension Service worked with the Kemper County Housing Authority to begin a summer reading project for the children in the housing complex. Mississippi Homemaker and community volunteers led literacy activities, and Mississippi Broadcasting donated children's books to each participating family.

b. Volunteers met four days a week for five weeks with 29 children ages 5-11. There were no discipline problems reported by the complex manager during this five-week time period. The nine parents who attended a special program at the end of the project estimated that their children were reading 30 minutes each day, compared to previous summers when they did not read at all. Summer reading day camps can cost \$50 per week per child, so this program provided an equivalent of \$250 of services to each child.

c. Smith-Lever Funds (amounts and FTE not available)

d. Extension

B. Stakeholder Input Process

Grassroots efforts to determine economic, social, and environmental issues begin with County Extension Advisory Councils. Further needs assessment is carried out through Research and Extension Center Advisory Councils, state-level advisory committees, and through formal and informal interaction with other stakeholders. Issues identified include concerns to be addressed with Extension and/or research programs. MSU-ES takes the leadership role, while MAFES and FWRC are involved and benefit from the process.

County Extension Advisory Councils

As a formal process, key clientele meet under the leadership of county Extension professionals to review results of programs and identify key issues to be addressed in the county or area. Input comes from three different groups: the Overall Extension Advisory Council, Program Advisory Councils, and other stakeholders.

Overall Extension Advisory Councils

MSU-ES has an Overall Extension Advisory Council in each county. These advisory councils meet a minimum of two times per year to discuss programming efforts, evaluate programs, legitimize program efforts, assess needs for future programming, and identify human and financial resources needed for county programming. This group includes leaders who provide input from business, social, and economic entities as well as those who represent the needs of underserved and underrepresented clientele, while constantly striving to ensure diversity.

Program Advisory Councils

Program and/or commodity advisory groups in each county act as subcommittees of the overall advisory council, including people who represent the interests of agriculture, family & consumer education, 4-H youth, and community and rural development issues. These groups meet at least two times per year to identify specific areas of program needs, and assist in planning, conducting, and evaluating programs.

Other Stakeholders

MSU-ES county agents are also required to obtain information regarding clientele needs from people outside the overall advisory council. They must give special attention to key community leaders and representatives of underserved populations, making sure all groups who are possible beneficiaries of MSU-ES programming efforts are included. These groups meet several times during the year to offer input and react to Extension's efforts to address key issues in the community. One important concern is to ensure programming efforts include a diverse clientele.

Research and Extension Center Advisory Councils

MSU has four area Research and Extension Centers (Delta, Northeast, Central, and Coastal) jointly administered by MSU-ES and the Mississippi Agricultural and Forestry Experiment Station (MAFES). These centers each have an overall advisory council where stakeholders lead discussions about programming and research efforts and assess needs at a yearly meeting. Subgroups of the advisory councils (e.g., forestry, family, row crops, etc.) meet several times during the year to discuss specific needs in research and extension programming.

Forestry and Wildlife Advisory Committees

Forestry, Forest Products, and Wildlife and Fisheries have advisory committees that meet yearly to identify issues and recommend research and extension programs to address those issues. Actions on these recommendations are reported at the next yearly meeting and further recommendations are made as warranted.

Other Sources of Needs Identification

MSU-ES, MAFES, and FWRC are continually looking for ways to interface with stakeholders to ensure that their needs are being addressed. The Agriculture and Forestry Summit and meetings with key partners are two examples of ways needs are identified.

Agriculture and Forestry Summit

MSU's Division of Agriculture, Forestry, and Veterinary Medicine conducts the Agriculture and Forestry Summit annually. The summit is a statewide planning process involving a diverse group of stakeholders. Results of the summit are used to develop research and extension priorities.

Key Partners

MSU-ES, MAFES, and FWRC meet with key partners throughout the year to discuss efforts and results, coordinate activities, and set priorities. These key partners include such organizations as the Mississippi Farm Bureau, Natural Resources Conservation Service, Delta Council, Rural Development Offices, Mississippi Forestry Commission, Mississippi Department of Wildlife, Fisheries, and Parks, Mississippi Department of Agriculture and Commerce, and numerous state and regional commodity groups.

C. Program Review Process

There have been no significant changes in Mississippi State University's program review processes since submission of our joint 5-Year Plan of Work.

D. Evaluation of the Success of Multi and Joint Activities

This evaluation of the success of the multi and joint activities is guided by the four criteria identified in the Guidelines for the State Plans of Work. Answers to each of the four questions are provided below.

1. Did the planned program address the critical issues of strategic importance, including those identified by the stakeholders?

Yes. Once the draft guidelines for AREERA were published, MSU initiated its new planning process. The priority planning groups (PPGs) for each of the 26 PPAs developed their plans for both research and extension.

To provide guidance for the program planning process, the PPGs not only used their professional expertise, but also had information at their disposal from the following sources:

- The stakeholder input process described above, including county and program advisory councils, state-level program advisory councils, research and extension center advisory meetings, key partners, and other sources;
- Outreach council meetings for research and extension;
- The county-level program delivery agreements developed by each local extension agent; and
- Professional peer review of the draft plans of work.

2. Did the planned program address the needs of under-served and under-represented populations of the State?

Yes. Through the stakeholder input process described above, needs of all clientele groups, including under-served and under-represented groups, were determined. (Most of the advisory groups mentioned in the stakeholder input process are required to be representative of all potential clientele.)

In addition to the stakeholder groups mentioned above, the outreach council recommended a series of meetings around the state. These meetings were designed specifically to obtain input from under-served and under-represented populations.

Another indicator of the extent to which programs are meeting the needs of under-served and under-represented groups is the percentage of contacts made by extension faculty. Of the 2,719,501 total contacts made by Extension, 731,903 (27%) were made to African-American, Native-American, or other under-served populations. This percentage is only slightly lower than the percentage of these under-served groups in the state population.

3. Did the planned program describe the expected outcomes and impacts?

Yes. Each priority program area developed one or more program plans. In each program plan, expected outputs and outcome/impacts were developed. Most of the outcomes identified were intermediate- or long-term outcomes.

4. Did the planned program result in improved program effectiveness and/or efficiency?

Yes. The creation of PPGs has provided a mechanism for researchers and extensionists to interact in the planning and implementation process. A required part of the joint plan of work is the sharing of information between the two "camps." The result has been the creation of numerous joint programs.

This result has been evident in some of the key theme reports provided under each of the five goals. Below are additional examples of these joint efforts.

Southern Regional Aquaculture Center

The U.S. consumes increasingly greater amounts of fishery products than it produces. A strong domestic aquaculture industry is needed to increase production of fish and shellfish and reduce dependency on foreign suppliers. Centers provide a mechanism for assessing aquaculture industry needs, establishing research and extension priorities, and implementing regional research and extension projects designed to directly impact commercial aquaculture development.

Components of the Southern Regional Aquaculture Center include an Administrative Center, Board of Directors, Industry Advisory Council and Technical Committee. The Board of Directors establishes overall regional research and extension goals and priorities, makes selection of proposals for funding and allocates fiscal resources. An Annual Plan of Work will be submitted to USDA outlining each program element and its compatibility with the National Aquaculture Development Plan and with regional priorities. 1862 and 1890 Land Grant institutions, Sea Grant institutions, other state, territorial or federal institutions, and non-profit private research organizations with demonstrated expertise and capabilities in aquaculture are eligible to participate in the regional programs.

The Southern Regional Aquaculture Center provides for coordination and prioritization of research and extension efforts across the southern U.S. This results in more efficient use of research funds and helps ensure that technology transfer occurs in an efficient and timely manner.

Advanced Spatial Technologies for Agriculture (ASTA)

There is a need to investigate site-specific technologies as they pertain to natural resource management, precision farming, agribusiness and decision making in agriculture and to produce

new knowledge concerning applications of these technologies in Mississippi and the Nation.

MAFES instituted the Advanced Spatial Technologies for Agriculture (ASTA) program to coordinate efforts on site-specific technologies. As part of the ASTA program, MAFES and MSU-ES faculty are conducting research and educational programs on site specific, precision farming technologies with regard to soil fertility management; pest management strategies; yield monitoring; problems associated with drainage, irrigation, aquaculture and other environmentally sensitive issues; and economic costs and returns associated with site specific production.

Some developments from this program include: 1) an improved superior cotton yield sensor, 2) prescriptions for nitrogen fertilizer in cotton that will improve average yield and reduce fertilizer runoff, 3) a pest management system that reduced insecticide costs by as much as 30%, and 4) variable rate prescriptions for a herbicide application system that can reduce material application rates significantly.

Nutrient Management and Water Quality Task Force

Management of animal waste has become a major environmental issue, with serious economic consequences for poultry and livestock producers. Improper animal waste disposal can negatively affect water quality.

MAFES Scientists and MSU-ES Specialists have joined together to form a Nutrient Management and Water Quality Task Force. This task force is designed to help address both immediate and long-term problems related to nutrient management and water quality issues. The task force formulates plans of action and helps to facilitate team building to address these issues in a timely manner.

This team has helped to initiate research on the effect of nutrient management on watersheds, and have aided in the development and dissemination of best management practices to help producers deal with these issues.

E. Multistate Extension Activities

MSU-ES identified 25 programs that meet the requirements for multistate and were supported by Smith-Lever funds. Many other programs meet the requirements for multistate, but were not supported by Smith-Lever funds.

Form CSREES-REPT (2/00) is provided below to summarize the fiscal activity for those multistate programs supported by Smith-Lever funds.

**U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities
(Attach Brief Summaries)**

Institution Mississippi State University
State Mississippi

Check one: **Multistate Extension Activities**
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures				
	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>Southern Extension & Research Activities</u>	<u>67,195.54</u>	<u>59,363.43</u>	<u>29,906.67</u>	<u>38,056.20</u>	<u>30,507.51</u>
<u>Money and You</u>	<u>5,873.56</u>	<u>5,732.24</u>	<u>15,285.16</u>	<u>5,667.54</u>	<u>15,491.99</u>
<u>Mid-South Fair</u>	<u>13,221.89</u>	<u>26,909.09</u>	<u>12,415.12</u>	<u>13,075.85</u>	<u>15,881.07</u>
<u>Southern Reg. Middle Managers Conference</u>	<u>5,973.00</u>	<u>3,915.97</u>	<u>2,234.15</u>	<u>2,139.07</u>	<u>1,917.97</u>
<u>Southern Reg. Volunteer Leaders Forum</u>	<u>115,672.75</u>	<u>26,378.86</u>	<u>23,483.63</u>	<u>12,216.28</u>	<u>13,049.26</u>
<u>Program Leadership Conference</u>	<u>40,495.01</u>	<u>41,026.67</u>	<u>40,346.28</u>	<u>23,838.18</u>	<u>22,028.74</u>
<u>National 4-H Congress</u>	<u>26,725.25</u>	<u>19,398.29</u>	<u>26,163.47</u>	<u>23,383.78</u>	<u>25,275.08</u>
<u>Tri-State Ministers Meeting</u>	<u>6,509.05</u>	<u>4,408.83</u>	<u>3,875.60</u>	<u>5,543.93</u>	<u>4,955.97</u>
<u>MS-LA Family Matters Conference</u>	<u>51,604.09</u>	<u>10,849.15</u>	<u>14,796.88</u>	<u>3,608.09</u>	<u>11,765.45</u>
<u>Franklinton Beef and Dairy Project</u>	<u>51,545.48</u>	<u>44,946.36</u>	<u>56,240.95</u>	<u>74,740.30</u>	<u>70,504.85</u>
<u>Cotman Project</u>	<u>12,959.98</u>	<u>12,553.79</u>	<u>10,995.03</u>	<u>14,925.52</u>	<u>19,814.88</u>
<u>Tri-State Soybean Forum</u>	<u>31,871.53</u>	<u>30,357.34</u>	<u>22,341.97</u>	<u>20,024.21</u>	<u>17,245.42</u>
<u>Delta States Farm Management Group</u>	<u>1,181.62</u>	<u>10,951.45</u>	<u>7,212.01</u>	<u>6,359.09</u>	<u>12,824.41</u>
<u>Beltwide Cotton Conference</u>	<u>9,426.63</u>	<u>2,737.86</u>	<u>2,885.82</u>	<u>2,575.61</u>	<u>7,805.23</u>
<u>Southern Reg. Extension Animal Scientists</u>	<u>6,676.73</u>	<u>7,059.07</u>	<u>2,305.25</u>	<u>2,558.93</u>	<u>1,740.95</u>
<u>Southern Forage & Pasture Improve. Conf.</u>	<u>4,925.84</u>	<u>0.00</u>	<u>1,213.80</u>	<u>1,208.38</u>	<u>1,247.51</u>
<u>National Ext. Livestock Specialists Conf.</u>	<u>10,555.36</u>	<u>0.00</u>	<u>0.00</u>	<u>2,558.93</u>	<u>1,740.95</u>
<u>Commercial Vegetable Recommendations</u>	<u>0.00</u>	<u>0.00</u>	<u>1,783.75</u>	<u>1,785.26</u>	<u>1,844.95</u>
<u>Greenhouse Tomato Short Course</u>	<u>0.00</u>	<u>0.00</u>	<u>3,576.44</u>	<u>3,639.71</u>	<u>3,757.96</u>
<u>National Catfish Database Committee</u>	<u>0.00</u>	<u>0.00</u>	<u>4,905.91</u>	<u>19,629.46</u>	<u>19,967.17</u>
<u>National Extension Technology Conference</u>	<u>0.00</u>	<u>0.00</u>	<u>2,238.50</u>	<u>5,615.68</u>	<u>4,657.61</u>

<u>S. Reg. Comm. on Public Affairs/Farm Mgt.</u>	<u>0.00</u>	<u>0.00</u>	<u>7,568.69</u>	<u>7,126.12</u>	<u>11,615.46</u>
<u>Southern Community Development Institute</u>	<u>0.00</u>	<u>0.00</u>	<u>1,741.40</u>	<u>6,936.71</u>	<u>10,972.67</u>
<u>Tri-State Fruit & Vegetable Growers</u>	<u>0.00</u>	<u>0.00</u>	<u>7,071.11</u>	<u>6,899.15</u>	<u>9,249.00</u>
<u>MS-LA Blueberry Growers Conference</u>	<u>0.00</u>	<u>0.00</u>	<u>3,234.52</u>	<u>2,970.31</u>	<u>4,982.79</u>
Total	<u>462,413.40</u>	<u>306,588.40</u>	<u>303,822.11</u>	<u>307,082.29</u>	<u>340,844.85</u>

Form CSREES-REPT (2/00)

Summary of Multistate Extension Activities

Southern Extension and Research Activities - A total of 30 information exchange groups (IEGs) and task forces (TFs) composed of regional representation meet to identify possible solutions to problems through research and extension. The common discussion leads to regional publications and programs.

Money and You - This project consists of an eight-lesson electronic curriculum designed to help limited resource families (particularly TANF benefit recipients) learn how to more efficiently manage their resources. The curriculum is being implemented in Mississippi primarily as a master volunteer program. The curriculum is now in full implementation stage with instruction provided by six area family resource agents and six county directors with family resource management programming responsibilities.

Mid-South Fair - Seventeen competitions and attendance contests are part of the five state collaborative effort with the Mid-South Fair held in Memphis, TN. States participating include: TN, MS, MO, AR, and KY. MS involvement includes preparation and participation of county delegations and specialists preparing and running the competitions, awards ceremonies and evaluation of contests.

Southern Region Middle Management Conference - This conference is comprised of area, district, and regional administrators from the southern states. The conference is held every other year hosted by different states. The primary purpose of the conference is professional development, idea sharing, and joint programming. The conference includes exhibits, breakout seminar sessions usually conducted by middle managers addressing personnel and program issues, and keynote speakers. Middle managers interact and develop professional relationships, and address concerns and issues that apply to the region.

Southern Region Volunteer Leader Forum - Thirteen states, Puerto Rico and the Virgin Islands cooperate in planning this volunteer training opportunity held in Rock Eagle, Georgia. Over 600 volunteers participate in workshops, super seminars and social events. Agents prepare volunteers for participation in the conference and assist them in presenting workshops upon their return. MS agents and specialists present workshops and assist with planning and coordination of the event held at Rock Eagle, GA.

Program Leadership Conference - Program leaders in Agriculture/Natural Resources, 4-H/Youth, Family and Consumer Sciences, Community Development, Program and Staff Development, and Computer Applications from around the Southern Region meet annually to identify issues and plan regional programs. A primary focus of this conference last year was the development of the Cooperative Extension Curriculum Project, which focuses on developing an electronic inservice education curriculum for the region, with interest being shown by other regions as well.

National 4-H Congress - 48 states participate in this national event. Mississippi specialists have served on the design team and provide leadership to specific committees. Over 30 youth from MS are involved in this four-day event that includes educational workshops, service learning opportunities, and keynote speakers. Agents are involved in the preparation of youth for this event.

Tri-State Minister Meeting - This meeting is a collaborative effort between the states of Arkansas, Mississippi, and Tennessee Extension Services. These systems have been providing educational programs to bi-vocational and community leaders in the region for more than 15 years. As issues have changed, Extension has changed to meet the needs of citizens in the tri-state area. A key ingredient for correcting these

issues and problems is the educational training offered through a Tri-State Conference, which has become a model for other states considering such an activity.

MS/LA Family Matters Conference - This conference focuses on critical issues facing families in today's society. Designed for three tracks—professional, adult, and youth—the conference provides workshops, exhibits, and keynote speakers. The conference attracts more than 300 participants annually

Franklinton Beef and Dairy Project - Joint program to conduct research and provide educational programs in beef and dairy between LA and MS. This project has provided most of the direction for dairy research and extension in MS. Results from several of the projects are discussed in the key theme reports under the five major goals in this report.

Cotman Project - This project provides educational information on cotton management including crop mapping, weather data use and early termination procedures used in the mid-south region.

Tri-State Soybean Forum - The purpose of this forum is to provide educational information for agents and specialists on soybean production and management from a multi-state perspective (MS, LA, AR).

Delta States Farm Management Group - This group collaborates on Extension farm management education and research programming opportunities in the MS, LA, AR multi-state area.

Beltwide Cotton Conference - This conference provides programming update information for agents and specialists on all cotton production and marketing areas on a multi-state basis, throughout the “cotton belt”. Specialists and agents interact with researchers and bring back important information to share with Mississippi cotton producers.

Southern Region Extension Animal Scientists - This meeting facilitates programming update and new program ideas to Extension specialists with a multi-state focus in the 13 state Southern Region.

Southern Forage and Pasture Crop Improvement Conference - This conference allows Extension and research professionals to identify educational programs on the latest issues regarding livestock utilization of forage and pasture.

National Extension Livestock Specialists Conference - This conference provides program updates and information on innovative programs to Extension professionals from all equine and meat animal-producing states. Retirements and budget cuts have limited MSU-ES participation in this important conference.

Commercial Vegetable Recommendations – This group meets annually to determine regional recommendations for vegetable publications and programs.

Greenhouse Tomato Short Course – For the past 10 years, MSU-ES has hosted this course for growers around the region and nation. This past year, specialists from around the region provided instruction to 105 participants from 22 states and 4 countries.

National Catfish Database Committee – Mississippi State University serves as the Lead Institution for the project, and will work cooperatively with other institutions in product development. National Catfish

Information Database (NCID) will be developed through nationwide cooperation among the colleges and universities in the land grant system, and will direct the best expertise in the nation toward the knowledge, educational and decision-support needs of the farm-raised catfish industry. NCID will develop a useful product for catfish farmers, resulting in a catfish industry that is better equipped to make informed decisions. Scientists from all appropriate catfish subject matter disciplines will be enlisted to cooperate in addressing these needs in a uniform and useable format. Through this public/private-sector partnership, the best knowledge-based, educational, and decision support tools will be provided to the nation's catfish producers. Discovery information and technology transfer will also be enhanced from the multi-million dollar public and private sector research investment to directly benefit the nation's leading aquaculture sector.

National Extension Technology Conference – NETC provides an opportunity for sharing and learning about innovative types and uses of information technology. MSU-ES personnel in computer applications and communications attend the conference and bring back information to share with Mississippians.

Southern Region Committee on Public Affairs/Farm Management – Agricultural economics Extension specialists participate on this committee yearly. Information shared at the committee meetings provided valuable input into the Farm Bill training provided by MSU-ES during the past year.

Southern Community Development Institute – This institute provides Extension specialists, regional directors, and Extension agents with an intensive, state-of-the-art training program related to community development. Participants learn the current nature of a community's economic, social, and service infrastructure; the essential elements of sound community development programming; and tools and strategies for working with communities on economic, social, and service infrastructure enhancements. Community development experts from around the region provide the instruction.

Tri-State Fruit and Vegetable Growers – MS, AR, and LA have cooperated on this conference for the past five years. The conference includes educational sessions on direct marketing and fruit and vegetable production. Trade show vendors include fruit tree nurseries, seed companies, chemical companies, equipment manufacturers, fertilizer manufacturers, drip irrigation companies, box companies and a number of other suppliers of interest to fruit and vegetable growers. The program has four concurrent tracks with sessions on fruits, vegetables, blueberries and organic production.

MS-LA Blueberry Growers Conference - Mississippi hosts this event annually for blueberry growers in cooperation with Louisiana. Growers learn production and marketing techniques at the conference, which has led to the formation of a marketing cooperative to increase sales.

F. Integrated Research and Extension Activities

As mentioned earlier, Mississippi State University chose to restructure its planning process after AREERA, both to meet federal requirements and to better serve its stakeholders within the state. This process led to the establishment of 26 priority program areas, 16 of which developed integrated research and extension plans.

Fiscal activity for these two plans is described in the two forms provided below: Form CSREES-REPT (2/00) (Hatch funds) and Form CSREES-REPT (2/00) (Smith-Lever funds). Although it may appear there are discrepancies between the two forms, some integrated activities may be supported with Smith-Lever funds but not Hatch funds, and vice versa.

Progress updates are provided for these activities in the planned program summaries above in Section A.

U.S. Department of Agriculture
Cooperative State Research, Education, and Extension Service
Supplement to the Annual Report of Accomplishments and Results
Multistate Extension Activities and Integrated Activities
(Attach Brief Summaries)

Institution Mississippi State University
State Mississippi

Check one: **Multistate Extension Activities**
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures				
	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>Agribusiness</u>	*	*	*	*	*
<u>Beef and Forage</u>	278,963	371,445	108,025	92,639	65,850
<u>Catfish</u>	*	*	*	*	*
<u>Corn</u>	23,980	50,034	46,309	39,224	22,787
<u>Cotton</u>	53,094	60,223	215,998	150,658	158,606
<u>Dairy</u>	*	*	143,976	310,472	435,255
<u>Food and Food Products</u>	425,342	307,201	277,235	279,633	165,828
<u>Forest Products</u>	*	*	*	*	*
<u>Forestry</u>	*	*	*	*	*
<u>Horticulture</u>	170,218	133,758	117,238	15,736	26,686
<u>Poultry and Products</u>	*	12,211	*	*	*
<u>Rice</u>	10,815	16,801	47,637	64,502	73,387
<u>Safety</u>	*	*	*	*	*
<u>Soybeans</u>	1,073	9,877	4,601	*	*
<u>Swine</u>	*	*	*	*	*
<u>Wildlife and Fisheries</u>	*	*	*	*	*
<u>(See addendum for detailed program/activity)</u>					
Total	<u>963,485</u>	<u>961,550</u>	<u>961,019</u>	<u>952,864</u>	<u>953,399</u>

Form CSREES-REPT (2/00)

Director Dance H. Watson

Date 4-13-05

* Integrated activity exists from non-federal sources.

**U.S. Department of Agriculture
 Cooperative State Research, Education, and Extension Service
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 Multistate Extension Activities and Integrated Activities
 (Attach Brief Summaries)**

Institution Mississippi State University
State Mississippi

Check one: **Multistate Extension Activities**
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Title of Planned Program/Activity	Actual Expenditures				
	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004
<u>Agribusiness</u>	<u>387,174.60</u>	<u>437,985.80</u>	<u>386,968.78</u>	<u>368,175.51</u>	<u>119,207.27</u>
<u>Beef and Forage</u>	<u>288,624.99</u>	<u>232,441.97</u>	<u>394,553.32</u>	<u>256,637.50</u>	<u>521,430.58</u>
<u>Catfish</u>	<u>71,862.72</u>	<u>100,967.05</u>	<u>77,210.11</u>	<u>113,103.68</u>	<u>134,415.34</u>
<u>Corn</u>	<u>73,613.51</u>	<u>62,430.72</u>	<u>69,365.54</u>	<u>91,702.76</u>	<u>200,152.18</u>
<u>Cotton</u>	<u>225,968.90</u>	<u>235,905.15</u>	<u>246,342.30</u>	<u>425,432.35</u>	<u>483,369.46</u>
<u>Dairy</u>	<u>52,168.17</u>	<u>28,900.17</u>	<u>50,685.18</u>	<u>37,577.87</u>	<u>66,169.25</u>
<u>Food and Food Products</u>	<u>37,140.07</u>	<u>24,296.79</u>	<u>24,951.99</u>	<u>37,827.20</u>	<u>43,866.12</u>
<u>Forest Products</u>	<u>36,467.68</u>	<u>41,322.87</u>	<u>23,344.24</u>	<u>38,383.71</u>	<u>21,238.55</u>
<u>Forestry</u>	<u>433,066.92</u>	<u>396,201.79</u>	<u>407,270.95</u>	<u>428,114.88</u>	<u>685,402.67</u>
<u>Horticulture</u>	<u>591,804.37</u>	<u>531,946.22</u>	<u>685,789.67</u>	<u>404,495.40</u>	<u>504,534.03</u>
<u>Poultry and Products</u>	<u>53,976.15</u>	<u>48,522.70</u>	<u>36,877.01</u>	<u>16,962.18</u>	<u>92,537.56</u>
<u>Rice</u>	<u>20,894.55</u>	<u>42,943.41</u>	<u>50,844.19</u>	<u>40,366.68</u>	<u>90,598.73</u>
<u>Safety</u>	<u>45,512.75</u>	<u>63,989.25</u>	<u>122,336.87</u>	<u>51,954.23</u>	<u>20,357.08</u>
<u>Soybeans</u>	<u>173,587.21</u>	<u>144,518.95</u>	<u>146,201.11</u>	<u>135,513.02</u>	<u>335,494.79</u>
<u>Swine</u>	<u>49,417.67</u>	<u>26,482.71</u>	<u>16,514.06</u>	<u>29,643.66</u>	<u>73,728.09</u>
<u>Wildlife and Fisheries</u>	<u>109,008.42</u>	<u>86,469.30</u>	<u>168,966.68</u>	<u>169,281.54</u>	<u>392,934.83</u>
Total	<u>2,650,288.10</u>	<u>2,505,324.87</u>	<u>2,908,222.00</u>	<u>2,645,172.17</u>	<u>3,785,436.53</u>

Form CSREES-REPT (2/00)

Summary of Integrated Research and Extension Activities

Beef and Forage – The goal of MAFES beef and forage research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of beef products that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the beef/forage industry are economically viable -- both now and for the future. These objectives are being addressed through the following projects:

Evaluation & Development of Beef Cattle/Forage/Management
Determination of Timp-2 in Bovine Follicular Granulosa Cells and in Follicular Development

Corn – The goal of MAFES corn research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of corn products that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the corn industry are economically viable -- both now and for the future. These objectives are being addressed through the following project:

Improving Mississippi Corn Production

Cotton – The goal of MAFES cotton research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of cotton/fiber products that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the cotton industry are economically viable -- both now and for the future. These objectives are being addressed through the following projects:

Weed Control and Harvest for Yazoo - MS
Cropping Management Systems
Identification & Management of Vegetable Insects

Dairy – The goal of MAFES dairy research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of dairy products (milk, cheese, butterfat, etc.) that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the dairy industry are economically viable -- both now and for the future. These objectives are being addressed through the following project:

Dairy Management for Mississippi

Food and Food Products – The goal of MAFES food and food products research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on 1) processing and adding value to raw products that can result in the development of new food and non-food markets for agricultural commodities and overall enhanced economic activity for Mississippi; 2) human nutrition research for maintenance of optimal health for all population groups, especially those at greater risk for nutrition-

related diseases, e.g., infants, elderly, new immigrant groups; and 3) on the causes and prevention of food-borne illnesses and food processing to increase food safety. These objectives are being addressed through the following projects:

Evaluation of New Cultivars
Plant Performance and Fruit Quality

Horticulture: – The goal of MAFES horticulture research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of horticultural products (i.e., vegetables, fruits, and ornamentals) that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the horticulture industry are economically viable -- both now and for the future. These objectives are being addressed through the following project:

Cultural Studies in Ornamentals

Rice – The goal of MAFES rice research is the creation of knowledge through fundamental and applied research. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable systems for providing consumers an abundance of rice products that are safe, nutritious, or otherwise have highly desirable attributes -- and to assuring that the producers and firms that comprise the rice industry are economically viable -- both now and for the future. These objectives are being addressed through the following project:

Rice Weed Control in Mississippi

In all of the areas mentioned above, the MSU-ES provides the extension efforts associated with the projects. MSU-ES provides dissemination of information and educational programming through group meetings, workshops, short courses, newsletters, and one-on-one consultations with producers.