FY 2005 Annual Report of Accomplishments and Results

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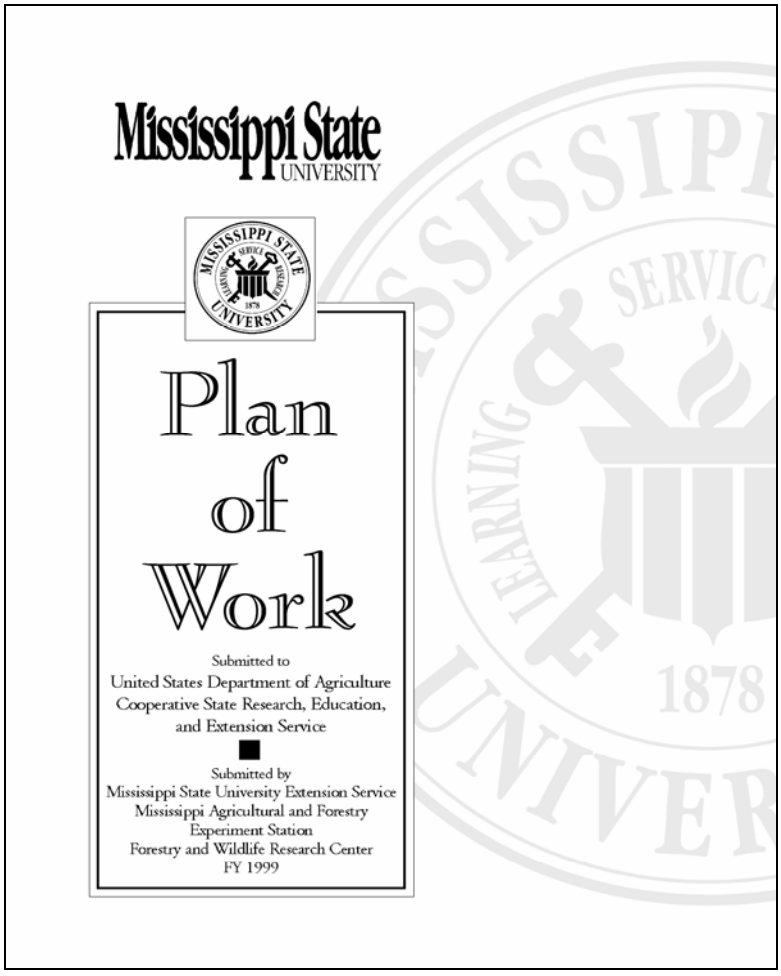

Joint Report
Mississippi State University Extension Service
Mississippi Agricultural and Forestry Experiment Station

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A. Planned Programs

Mississippi State University (MSU), including the Mississippi State University Extension Service (MSU-ES) and the Mississippi Agricultural and Forestry Experiment Station (MAFES), has undergone a major restructuring since submission of the 1999 Plan of Work. As noted in the FY 2005-2006 Plan of Work Update, MSU has organized its research and extension efforts into 16 priority program areas (PPA). While some of the efforts have remained the same, the organization has changed. 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 under each listed after the PPA. Each program is classified as either Integrated Research and Extension (IR&E), Research (MAFES), or Extension (MSU-ES).

Agronomic Crops

- Production and Management Systems for Corn and Small Grains (IR&E)
- Production and Management Systems for Cotton (IR&E)
- Harvesting for Agronomic Crops (IR&E)
- Irrigation of Agronomic Crops (IR&E)
- Production and Management Systems for Rice (IR&E)
- Production and Management Systems for Soybeans and Peanuts (IR&E)
- Soil/Fertility/Fertilizers for Agronomic Crops (IR&E)
- Variety Evaluation Selection (IR&E)
- Genetics and Variety Development (MAFES)
- Weed Control (IR&E)

Animal Science/Forages

- Beef Production and Management (IR&E)
- Dairy Production and Management (IR&E)
- Swine Production and Management (IR&E)
- Forage Production (IR&E)
- Beef and Forage Genetic Improvement (MAFES)

Aquaculture

- Catfish Production and Management (IR&E)
- Crawfish Production and Management (IR&E)
- Shrimp/Prawn Production and Management (IR&E)
- Fish Behavior (MAFES)
- Fish Health (MAFES)

- Harvest Technology (MAFES)
- Nutrition (MAFES)
- Water Quality (MAFES)

Enterprise and Community Development
- Food and Food Products (MSU-ES)
- Forest Products (IR&E)

Forestry
- Forest Management (IR&E)
- Logger Education (IR&E)
- Timber Marketing (IR&E)

Horticulture
- Commercial Nursery/Landscape Production (IR&E)
- Fruit Production (IR&E)
- Turf Production (IR&E)
- Vegetable Production (IR&E)

Poultry
- Breeder Management (IR&E)
- Broiler Management (IR&E)
- Hatchery Management (IR&E)
- Reducing Malodor and Pathogens (MAFES)
- Lipoproteins and Egg Mycoplasma (MAFES)
- Fertility in Broiler Breeders (MAFES)
- Cocci Vaccine Development (MAFES)

Risk/Farm Management
- Agriculture and Natural Resources/Environmental Programs and Regulations (IR&E)
- Marketing (IR&E)
- Risk Management (IR&E)

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**
Agronomic Crops	49	8	0	216,763
Animal Sciences/Forages	41	0	3	188,871
Aquaculture	25	1	0	7,162
Enterprise and Community	9	0	1	1,209

Development				
Forestry	0	0	0	97,400
Horticulture	30	2	3	75,537
Poultry	20	0	0	1,556
Risk/Farm Management	0	0	12	23,955

Overall Expenditures for Goal 1

Function	FTE	Expenditures*
Experiment Station	57.65	$25,560,107
Extension Service	64.35	$4,431,820

* 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 – Plant Production Efficiency

a. Producers continue to seek ways of increasing cotton production and continue to hear of the need for chemical plant growth regulation. While products to control growth continually appear in the marketplace, consistent yield increases and ultimately consistent profitability has yet to be demonstrated. Cotton, a perennial, continues to be grown as an annual that requires unique management compared to traditional annual crops such as corn or soybean. Physiological stresses on cotton tend to delay or terminate reproductive growth in favor of renewed vegetative growth. Increasing nitrogen rates does not always lead to increased yield nor does the application of plant growth regulators. Multiple year studies have been underway to access the interaction of nitrogen management (rates and application systems) with plant growth regulators (PGR's). In this particular study the PGR is mepiquat pentaborate (Pentia™) with initial applications beginning at early bloom in 2003 and 2004 and at the pin-head square (PHS) growth stage in 2005. Lint yield results from 2003 and 2004 showed no response in 2003 and a significant yield reduction in 2004. The reduction ranged from 7-10% (85-117 lb lint/acre). Other data collected suggested that PGR applications initiated at PHS did not reduce lint cotton yields. In 2005, lower rates of PGR were initiated at PHS with positive results. Lint yield increases in 2005 ranged from 72 to 101 lb lint/acre. The largest response occurred at optimum N rates (90 to 120 lb N/acre). The 2005 crop was adversely affected by both Hurricanes Katrina and Rita with obvious yield reduction due to heavy rainfall and wind. This study will again be repeated in 2006 to determine whether shifting to PHS will be advantageous compared to early bloom.

b. Research from the first two years of the study resulted in no response or a significant reduction in

lint production. When reduced yields are coupled with the cost of product and the cost of application, the effects of PGR application was severe. Numerous studies over the years have shown that the best plant regulator for cotton is fruit load. Protecting early fruit is far more important than the use of a PGR. Increasing N rates coupled with the use of PGR's has not shown any consistent results. While the use of PGR's continues, the profitability of such inputs continues to be questioned.

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

d. Integrated Research and Extension

Key Theme – Biofuels

a. Global dependence on petroleum based fuels is increasing rapidly. Therefore it is imperative that alternative renewable fuels be developed with a committed attitude. Scientists at MSU are developing new systems for the generation of alternative fuels from biomass. The Braasch lab is dedicated to multiple projects that share one focus in using and manipulating biological resources in the production of alternative or enhanced materials that can be converted to fuels. Integral to this process is the understanding of how biological systems generate genes involved in pathways related to the production of and release of molecules such as gasses and lipids in addition to their overall composition which may have uses in areas yet untapped. The use and development of new methods for genetic regulation in these systems aids in the overall production of biomass usable for the production of fuels. A component of these efforts is also aimed at evaluating alternative crops that lend themselves naturally to the production of fuel based components.

b. The economic impact of these efforts is substantial in that we aim to produce fuels at a cost less than petroleum based fuels and stabilize the global economy. Reduced cost of fuels has large implications for every individual's budget directly as it relates to personal transportation costs and in price of goods and services paid for in every aspect of life. Scientifically the new processes being developed are novel and contribute to the areas of basic science in addition these new fuels can be considered green fuels which reduce caustic emissions and are thus better for the environment. Taken together, these efforts are intended to diversify the crop base of the state and region enabling growers to obtain a more consistent and reliable economic base while simultaneously reducing their cost of operations.

c. Hatch funds (amounts and FTE not available)

d. Research

Key Theme – Plant Production Efficiency

a. Corn production in the Mississippi delta has increased significantly in the last decade with more than 500,000 acres in production in some years. Record yields have been produced in two of the last three years in the state. Rotation provides an opportunity to increase yields of cotton without

increasing input costs of the crop. Sufficient animal agriculture is located in the state to utilize the grain produced, however, due to the strategic location of much of the grain; it has been shipped out of the region with producers receiving premiums. As fuel prices from petroleum-based products continue to escalate, bio-based fuels (alcohol and bio-diesel) may become more and more advantageous to the region. Long-term cotton corn rotations have been established to examine the response of cotton following corn as compared to cotton following cotton in production systems. Two three-year cycles have been completed to date on different soil types at different locations. The response to rotation has ranged from –8.8% to +51.7% at the Delta Research and Extension Center near Stoneville on a Bosket very fine sandy loam soil. This is an average increase of 108 lb lint/acre/year (12.1% increase/acre/year). On the heavier textured soils at the Tribbett Satellite Farm (Forestdale/Dundee silty clay loam) the response to rotation has ranged from –11.0 to +45.5% with and average yield increase of 68.2 lb lint/acre/year (7.2% increase/acre/year. The largest percent increase has been in unusually dry years at each location with the negative responses occurring in years where excess rainfall has been detrimental to more vegetative plants. Boll rot has been particularly detrimental in certain years. The use of corn in rotation with cotton has also been deemed useful in the regulation of nematodes in cotton. Systems that rotate from corn to cotton have seen a marked reduction in nematode numbers during the season. The effects of soil nutrients on nematode numbers are yet to be determined.

b. With the shift from monocrop cotton to corn/cotton rotations or rotations that incorporate other crops, per unit cost of cotton production can be reduced. This would increase the profitability of cotton. Irrigated corn in the Mississippi Delta has been shown to be profitable and with the potential to reduce general farm overhead. Current evaluations of tillage reductions in rotations systems can also lead to better environmental stewardship and less potential nutrient and soil loss from fields. This leads to a cleaner environment and less non-point source pollution. The overall impact is reduced costs of production and increased profitability.

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

d. Integrated Research and Extension

Key Theme – Agricultural Profitability

a. Katrina inflicted substantial physical damages and revenue losses to various agricultural sectors across the state and region. These damages and losses have had a dramatic effect on the lives and income producing abilities of farmers impacted by this storm. Farmers, farm organizations, policymakers, and media personnel are vitally concerned about the amounts and extent of Katrina damages and losses. Farmers and their organization used estimates of storm damages and losses to ask for assistance from state and federal governments. Media used these estimates to report the amount of suffering caused and will cause by this hurricane. A detailed assessment of damages and losses were estimated for all the major agricultural sectors in Mississippi. These estimates were utilized by farmers, farm organizations, policymakers, and the media to convey information about the suffering caused by Katrina. These estimates were published in an Extension Bulletin for distribution to all interested parties.

b. Damage estimates were as follows:

Crop	*Total Estimated Loss ($ Millions)*
Cotton	$36.41
Soybeans	$5.95
Rice	$14.22
Corn	$2.10
Grain Sorghum	$0.07
Dairy	$21.08
Beef & Forage	$71.04
Poultry	$93.55
Horticultural Crops	$18.00
Total Agricultural Losses	**$262.42**
Forestry	$1,280.00
Total Agriculture and Forestry Losses	**$1,542.42**

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

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Delineating amino acid needs of modern commercial broilers is critical because feed represents over half of live production costs and broiler tissue accretion rates evolve based on primary chicken breeder selection. MSU researchers discovered an amino acid profile that optimized white meat yield by 0.28% in the breed used most for high yield production in Mississippi, resulting in an improved profit (income over feed costs) of $0.016/bird.

b. This results in an improved profit of $16,000 for a typical complex per week, or $13.6 million for Mississippi's broiler companies per year.

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

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Cotton producers are concerned about refuge costs and possible changes to refuge sizes. An analysis of Bt cotton refuges was continued in 2005 to address the loss in revenue to Mid-South cotton producers.

b. Preliminary analysis suggests Bt cotton refuges may be costing producers as much as $60 per acre. This information provides farmers leverage when negotiating with seed companies and helps them manage their operations for greater profit.

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

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Nitrogen management in rice is difficult because of the transformations that N can undergo in the rice production environment. One method in which N is lost is through ammonia-volatilization. N-loss can negatively impact the producer and the environment by reducing yields and contributing to the accumulation of greenhouse gases. In 2005, experiments were conducted to evaluate an ammonia-volatilization inhibitor for rice production. The chemical compound that binds to N-fertilizer produced yields that averaged approximately seven bushels per acre more than untreated fertilizer.

b. These data suggest that the grower can improve his economic returns by up to $20 per acre while decreasing the amount of N lost to volatilization.

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

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Sperm Quality Index (SQI) is correlated with and predictive of sperm concentration, motility, and viability as well as fertility of fresh broiler breeder semen. Being able to accurately predict avian male fertility could be very useful to poultry scientists and the poultry industry by allowing for male selection, better semen storage protocols, and improved male management schemes. However, neither scientists nor poultry industry personnel completely understand what physiological or environmental factors influence the SQI. Three concerns were addressed in response to this issue. First of all, it is not known if the SQI of chicken semen is predictive of the normal decline in semen quality due to in vitro semen storage. Secondly, semen must be diluted 10 fold for accurate SQI analysis; however, it is not known why higher semen dilution rates that are

used for other standard sperm evaluation test yield inaccurate SQI results. Thirdly, trace elements, such as Se, Mn, and Zn, can alter reproductive functions, but it is not know if the SQI is directly affected by these minerals. Three experiments were conducted in an attempt to answer these three concerns.

b. Because we have shown that the SQI is predictive of stored semen quality, poultry scientists and poultry industry personnel can begin to use the SQI to evaluate stored semen samples. The use of the SQI to examine stored semen samples should save both the poultry industry and poultry scientists time and money, because the SQI is about $1/10^{th}$ as expensive and more than 15 times faster than other automated means of semen evaluation. Additionally, insemination of poor semen leads to costly loses to the poultry industry every year that could be prevented with the SQI.

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

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. Bt and Roundup Ready technologies are now dominant in variety selections. Over 95% of the cotton acreage in Mississippi in 2005 was in some type of transgenic variety. Seed costs have increased from approximately $15/A to nearly $70/A for these new technologies. To offset high seed cost and technology fees, interest in reduced seeding rates has increased correspondingly. Studies were conducted on a Bosket very fine sandy loam in Stoneville, MS during 2003 through 2005. The experimental design was a split plot in a randomized complete block design with varieties as main plots and seeding rates as subplots with four replications. Plot size was four rows by 50 feet long on a 40” row spacing. Three transgenic varieties, ST 4892BR, ST 5599BR, and DP 555BR were selected for evaluation based on availability and producer popularity.

b. Differences in lint yield due to variety and seeding rate were observed with no variety by seeding rate interaction for any of the three years. Averaged across seeding rates, DP 555BR had higher lint yield than ST 4892BR all three years of the study and higher than ST 5599BR in 2 of the 3 years. The lowest seeding rate had lower lint yield compared to the two highest seeding rates all three year. There were no differences in lint yield for the three highest seeding rates two of the three years. However, when averaged across years, there was a trend for higher lint yield as seeding rate increased. Farmers now know that they should not lower their seeding rates in most situations, which will help them optimize their yield per acre.

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

d. Integrated Research and Extension

Key Theme – Animal Production Efficiency

a. Feed cost typically accounts for about 50% of variable operating costs in catfish production.

Development of cost-effective feeds while maintaining rapid fish growth and product quality will increase profitability of catfish farming. Since protein is the most expensive nutrient and fish meal is the most expensive ingredient in catfish feeds, reducing dietary protein and fish meal levels in catfish feeds, without compromising fish performance or product quality, are the most effective methods to reduce feed cost. Developing optimum feeding strategies for different management and culture conditions can potentially lead to improved feed efficiency and increased farm profits. Several studies have been conducted by scientists at the Delta Research and Extension Center/National Warmwater Aquaculture Center to evaluate optimum dietary protein and fish meal levels in catfish feeds and various feeding strategies to reduce feed cost and improve feed utilization efficiency.

b. Research has shown that dietary protein levels can be reduced from 32% to 28% without adverse effect on fish growth and production. Using the 28% protein diet could save up to $8 per ton of feed, which equates a savings of about $50 per acre annually. Our research also indicates that catfish grown from advanced fingerlings to market size can be fed soybean meal-based, all-plant protein diets without affecting fish performance. Using low fish meal diets or all-plant protein diets could result in savings of about $2 per ton and $1.3 M for the catfish industry annually.

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

d. Integrated Research and Extension

Key Theme – Plant Production Efficiency

a. The amount and incidence of application for N is largest for rice; however, it also can provide the greatest return per amount applied. In 2005, rice growers in Mississippi applied approximately 26,000 tons of N at a cost of approximately 17 million dollars. Growers have the opportunity improve their bottom line when N is managed properly. Experiments were conducted to evaluate the response of new varieties, hybrids, and experimental lines to nitrogen (N) on two soil types. The experiments were designed to determine optimum preflood and topdress rates of N for agronomic and economic yield. The data suggest that clay soils require 20 to 30% more N than silt loam soils. In addition, the highest economic yields were achieved when no more than 30 lb N/a was topdressed for clay soils. Furthermore, the data suggest that silt loam soils do not respond economically to topdress N.

b. Collectively, growers could reduce their N fertilizer costs by approximately 1.3 million dollars based on these data. Additionally, approximately 2.5 million pounds of N less would be applied.

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

d. Integrated Research and Extension

Key Theme – Plant Health

a. Soybean rust is a devastating disease often causing 60-80% yield losses and there are not resistant commercial varieties. Soybean rust causes significant losses throughout South America. Soybean rust was identified in the United States in 2004 and has spread in 2005. This disease has the potential to cause significant yield losses throughout the soybean growing regions of the United States. Fungicide applications can control the disease but they are expensive and optimum fungicides, rates, and timings are not known. Routine fungicide applications are not needed until rust becomes established. Soybean producers are very interested in what rust (identification) is, how, when, and if foliar fungicide applications are needed, which fungicides to use and if there is any tolerance to the disease. Several fungicides have received a Section 18 registration for control of soybean rust. Sentential plots and spore traps have been established in each state to monitor progress of the disease. Publications on identification of soybean rust have been developed by Mississippi in cooperation with other states. A publication entitled "Suggested guidelines for using fungicides to manage soybean rust" MSU Extension Publication 2371 has been distributed to producers. This is a comprehensive guide on when to use fungicides for rust control. This publication was copied in part by several other states.

b. This publication along with information from sentential plots was used by producers in 2005 to make decisions on use of foliar fungicides. As a result, very few soybeans were sprayed for rust. This resulted in significant savings to producers and allowed to direct fungicide use to the control of other diseases. The research and extension activities kept soybean producers and consultants informed about soybean rust and other soybean diseases. Producers were able to use this information to make decisions regarding the impact of rust and the use of foliar fungicides on their soybeans. This prevented dissemination of false information and resulted in the judicious use of foliar fungicides. Therefore, the producer and consultant avoided the use of foliar fungicides where they were not needed and the use of ineffective fungicides.

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 under each listed after the PPA. Each program is classified as either Integrated Research and Extension (IR&E), Research (MAFES), or Extension (MSU-ES).

Agronomic Crops
- Safety (IR&E)

Nutrition and Food Safety
- Basic Foods (IR&E)
- Food Preservation (IR&E)
- Food Safety (IR&E)

Aquaculture
- Catfish Food Quality and Safety (MAFES)

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
Agronomic Crops	3	0	0	9,135
Nutrition and Food Safety	0	0	1	36,787
Aquaculture	16	1	0	

Overall Expenditures for Goal 2

Function	FTE	Expenditures*
Experiment Station	4.77	$1,066,924
Extension Service	5.00	$277,702

* 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 Quality

a. Farm-raised catfish are the fifth most commonly consumed seafood in the United States and are the most important farmed-fish species in the county. One of the most important market attributes of the fish is consistent flavor quality. However, farm-raised catfish often develop undesirable pre-harvest "off-flavors." These flavors are come from odorous, but non-toxic, chemicals produced by algae growing in fishponds. Although off-flavors eventually disappear from fish, farmers are often forced to hold market-sized fish in inventory while awaiting flavor improvement. Reduced cash flow, increased risk, and lost production time costs catfish farmers $15 to 75 million per year. Mississippi State University scientists at the National Warmwater Aquaculture Center in Stoneville, Mississippi, developed simple treatments for algae-related off-flavors using the safe, inexpensive algicides, copper sulfate and diuron. These treatments were extensively tested for efficacy and safety under farm conditions.

b. These treatments have been widely adopted by the catfish industry and reduce the incidence of undesirable flavors by over 50% with benefit to cost ratios of approximately 40 to 1.

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

d. Integrated Research and Extension

Key Theme – Foodborne Illness

a. It is estimated that 3,000,000 to 6,000,000 people in the United States cannot consume food products containing wheat either due to a food allergy or Celiacs disease, a condition where consumption of the protein in wheat can lead to extensive damage to the small intestines. Wheat flour is in a high percentage of food products and can lead to serious health problems in individuals affected with these conditions. Wheat flour is an integral part of breads and breaded products so it is found in a high percentage of food products. Wheat-free, breaded products do exist in the health food section but not in the mainstream part of the grocery store in which people traditionally buy their food products. Introduction of food products that are familiar to consumers, wheat-free, and highly acceptable will meet the need of a niche market that is currently unavailable to consumers. The number of wheat-free, breaded products needs to be increased in order to meet this need as well as increase the awareness of Celiacs disease and wheat allergies. Poultry and rice are two of the largest agricultural industries in the State of Mississippi. These commodities can be utilized in the formulation of a low-fat, wheat free chicken nugget that is acceptable to consumers and, sold in the mainstream portion of the grocery store, and can be marketed to individuals who are either health conscious or cannot consume wheat. Meeting this niche market would benefit consumers, the food industry, and retail grocers since it would increase the use of rice and meat products as well as meet consumer needs. Researchers at Mississippi State University have developed a both a low-fat, wheat-free chicken nugget that is healthy and highly acceptable to many consumers. A wheat-free, fried chicken nugget that is not low-fat has also been produced that is acceptable to consumers.

b. It is expected that production of chicken nuggets and awareness of the need for wheat-free products will economically benefit consumers who have trouble locating wheat-free products. The food industry will also benefit from having an increased avenue for food production, and agricultural industries that are important to the state of Mississippi (including the poultry and rice industries) will benefit from new outlets for their commodities. People with Celiacs disease and wheat allergies would benefit socially since they would have an improved food supply, and people who have not heard of Celiacs disease will have an increased understanding and knowledge of this health issue.

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 under each listed after the PPA. Each program is classified as either Integrated Research and Extension (IR&E), Research (MAFES), or Extension (MSU-ES).

Health

- Health and Safety (IR&E)
- Health Career Development (MSU-ES)
- Coalitions/Community Partnerships (IR&E)
- Mississippi Homemaker Education Volunteers (MSU-ES)

Nutrition and Food Safety

- Human Nutrition (IR&E)
- Nutrition Related Disease (IR&E)
- Expanded Food and Nutrition Program (MSU-ES)
- Family Nutrition Program (MSU-ES)

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
Health	17	1	11	202,774
Nutrition and Food Safety	9	0	17	748,347

Overall Expenditures for Goal 3

Function	FTE	Expenditures*
Experiment Station	1.07	$267,454
Extension Service	62.02	$2,826,570

* 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 –Health Care

a. Mississippi has the second to lowest number of physicians per capita in the nation. Clearly, this limits access to care for the state's residents and contributes to many of the negative health status indicators plaguing the state. A recent study found that 56 % of all Mississippi physicians are located in four urban areas. In a state that is predominantly rural, this concentration of physicians leaves 51 of our 82 counties to be classified as medically underserved. In response to this concern, Mississippi State University Extension Service developed and directs the Rural Medical Scholars (RMS) program. The objective of the program is to "grow local docs" for the state by identifying talented and interested high school students and exposing them to academics and experiences relevant to the life of a family medicine physician. During the 5-week summer program, the Scholars enroll in two pre-medicine courses, "shadow" local physicians, and participate in a variety of activities related to rural physicians. The program encourages pursuit of a medical career and helps students answer that all-important question, "Do I want to be a doctor?" They gain knowledge and experience that assist in that decision and increase their future competitiveness when it comes time to apply for medical school.

b. Previous Scholars are just arriving at the point in their academic careers when medical school is becoming a reality. The first three entered medical school in 2003; today, 11 of our graduates are enrolled in medical school and at least 3 more will begin in the fall of 2006. In addition to future physicians, many program graduates have gone on to pursue careers in fields such as nursing, pharmacy, optometry, physical and occupational therapy, as well as biological and medical research. The program is beginning to pay dividends for the state. The first Scholar to be accepted to medical school plans to specialize in family medicine and return to practice in his hometown where the three family practice physicians in the county are close to retirement age. This Scholar is clearly meeting the need that the program was designed to accomplish—assuring the availability of primary care physicians throughout rural Mississippi. Since its inception in 1998, 168 students have participated in the RMS program.

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

d. Multi-State Extension

Key Theme – Human Nutrition

a. Overweight and obesity among all ages is a major concern in Mississippi. Overweight and obesity pose a major risk for chronic diseases including diabetes, cardiovascular disease, hypertension and stroke, and certain forms of cancer. The prevalence of obesity in Mississippi in 2001, defined as a Body Mass Index (BMI) greater than 30 kg/m^2 was 25.9 and was the highest in the country. The Family Nutrition Program held youth and adult nutrition classes during 2005 in a total of 767 locations throughout Mississippi, including schools, churches, extension offices, etc.). A total of 200,124 direct contacts were made through these classes. In addition, 132,629 indirect contacts were made through newsletters, radio, TV, and other forms of media.

b. Results of Evaluation Studies

Youth Hand Washing
Measured using pre- and post-test tools.
Of 1,962 participants, there was an 8% increase in the number of participants who knew the correct reasons to wash their hands (to kill germs and keep from getting sick).

Of 1,132 participants, there was a 6% increase in the number of participants who knew when to wash their hands.
Youth Hand Washing
Measured using post-test only tool.
Of 674 participants, after one lesson, 96% knew the correct reasons to wash their hands (to kill germs and keep from getting sick).

Of 264 participants, after one lesson, 78% knew when to wash their hands.
Youth Survey
Measured using pre- and post-test tools.

Of 4,350 participants, there was a 10% increase in fruit and vegetable consumption most days.

Of 4,350 participants, there was a 7% increase in washing hands before eating most days.

Of 4,350 participants, there was a 7% increase in playing actively (examples of active play: run, walk, bicycle, play ball, roller-blade, skate-board, swim, jump rope) most days.

Taste Test Results (15,829 participants)

October 2004 through September 2005	
Number of times food was presented	*1,153
Number of participants present during taste tests	15,829
Number of times food was tasted	**41,362
Number of participants who liked the food	***19,286
Number of participants who 'maybe' liked the food	1,165
Number of participants who did not like the food	1,865
Number of participants who might try the food again	19,046

*Foods presented related to a Food Guide Pyramid lesson (various dairy products, raw fruits and vegetables, meat items, and grain items). Unusual items were presented when possible (for example: mango, kiwi, kumquats, rutabagas, and star fruit). [According to the US Department of

Health and Human Services, it may take ten or more tries before a child accepts a food (http://win.niddk.nih.gov/publications/child.htm .]
** Actual number of times various foods were tried. Multiple foods were offered per taste testing event.
*** Some participants were counted more than once, since they received more than one food item and/or were present for more than one taste testing event.

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

d. Multi-State Extension

Key Theme – Human Health

a. Although early childhood caries (tooth decay) is preventable, it remains the most prevalent chronic childhood disease in the United States, occurring five times more often than childhood asthma. Increasingly, research demonstrates the influence of early events during childhood on one's health status during adolescence and adulthood. Early events in childhood may have striking effects on adult health status, leading to problems such as obesity, heart disease and poor mental health. Thus, assessing and intervening early to establish sound healthy environments and behavior is critical to improving overall health. This is particularly true in the prevention of early childhood caries. A critical time in prevention of this disease occurs in the preschool years, given that it is most often established within the first two years of a child's life. We have established a network of 19 child care centers within the Mississippi Delta to conduct pilot studies to investigate the predictors of early childhood caries. A total of 768 dental assessments of preschool children have been conducted at the child care sites by pediatric dentists during the first phase of this project. The overall goal of this pilot study is to examine the feasibility of delivering a comprehensive, multi-modal intervention to prevent and reduce dental caries and related dental problems among infants, toddlers, and preschoolers using child care settings in rural, impoverished communities as the delivery venue. The intervention phase began in the summer of 2005 with interventions every three months in six of the child care centers, with 186 children having received interventions (oral health assessments, fluoride varnish applications).

b. Establishing and refining criterion for children who are at highest risk for developing early childhood caries holds promise for reducing the burden and cost of disease. The importance of understanding a broad array of risk factors within young children's environments is critical. Our research is important in promoting risk assessment tools to better identify the children most at risk, and thus, fostering tailored interventions for prevention and/or delayed onset of the disease.

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 under each listed after the PPA. Each program is classified as either Integrated Research and Extension (IR&E), Research (MAFES), or Extension (MSU-ES).

Agronomic Crops
- Integrated Pest Management (IR&E)

Aquaculture
- Game-Fish Culture (IR&E)

Environment/Nutrient Management
- Animal Waste Management (IR&E)
- Soil Management (IR&E)
- Water Quality (IR&E)
- Environmental Stewardship (MSU-ES)

Horticulture
- Integrated Pest Management (IR&E)

Wildlife/Fisheries
- Wildlife Management (IR&E)
- Fisheries Management (IR&E)
- Ecology and Management of Sustainable Resources (FWRC)
- Ecosystem Management and Restoration (FWRC)

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
Agronomic Crops	0	0	4	13,377
Aquaculture	0	0	0	99
Environment/Nutrient Management	0	0	3	13,792
Horticulture	0	0	4	38,578
Wildlife and Fisheries	4	0	1	

Overall Expenditures for Goal 4

Function	FTE	Expenditures*
Experiment Station	13.49	$4,624,083
Extension Service	9.15	$842,111

* 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 – Wildlife Management

a. Private, nonindustrial forest landowners own about 135 million acres in the Southeast and have a diversity of management objectives including financial timber returns, recreation, aesthetics, and provision of wildlife habitat. Private, non-industrial forest landowners own almost 13 million acres in Mississippi. Lack of active management and fire suppression in upland pine habitat commonly produces a mid-story of unmerchantable hardwoods that limits pine production and reduces habitat quality for economically valuable white-tailed deer, turkey, bobwhite quail, and many non-game species that are in decline. Management actions are needed to improve wildlife habitat quality in pine habitats so that landowners can optimize wildlife recreation-based income while improving timber production. A recently developed technique, referred to as "quality vegetation management" incorporates the selective herbicide ARSENAL® and controlled burning to improve wildlife habitat conditions for economically valuable wildlife species and to promote increased pine productivity. An evaluation in the Forest and Wildlife Research Center of quality vegetation management in east-central Mississippi showed that deer nutritional carrying capacity increased to 400%. Improved nesting and brood foraging habitats also increased carrying capacity for bobwhite quail and turkey. This technique also increased avian species richness and abundance of non-game birds of regional conservation concern. Scientists at MSU promoted the positive effects of quality vegetation management using popular and scientific publications, radio interviews, and field tours of our research sites. Additional, large-scale research and demonstration plots have been established on Conservation Reserve Program and Forestry Incentive Program lands in central and southern Mississippi.

b. Landowners can be reimbursed by the USDA and Mississippi Forestry Commission for up to 50% of the treatment costs for quality vegetation management on Conservation Reserve Program and Forestry Incentive Program lands. These cost-shares can benefit Mississippi non-industrialized forest landowners on 885,000 acres enrolled in CRP and 407,000 acres active in FIP. As a result of our research, the Alabama Forestry Commission and the USDA in other states are also considering cost-share incentives for quality vegetation management, so the benefits to landowners will spread throughout the Southeast. In addition to the landowner financial benefits, wildlife habitat quality will improve for the economically valuable white-tailed deer, turkey, and quail and numerous non-game species of regional conservation concern.

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

d. Integrated Research and Extension

Key Theme – Water Quality

a. The U.S. National Park Service is currently working on a national species inventory and water quality for their databases in streams located at Vicksburg National Military Park. In addition, the National Park Service is concerned about recently established non-endemic fishes occupying streams at Vicksburg and their impact on native species to the area. There is no historical record of fishes in the streams at Vicksburg. Because many endemic, rare, and threatened species exist within the region, it is a well suited site to remove the current population of invasive species previously introduced from other parts of the United States and establish stream fishes more typical to the region. Current prolific populations of the accidentally introduced fathead minnow has altered the ecological potential in sustaining a more natural community of stream fishes, and their removal will allow a high probability of a successful establishment of endemic species. Water quality and habitat monitoring has been important to maintaining a long-term database to track future environmental changes in National Park Service streams and assessment is essential for appropriate environmental evaluation of stream conditions. The management and restoration of these streams serve as a national demonstration of restoring native endemic stream fishes in a biologically altered stream and maintenance of ecological integrity in National Park Service's streams. MSU researchers developed a long-term data set to serve as a species inventory and to document changes in habitat and water quality. Fishes, invertebrates, water quality, aquatic plants have been monitored during a ten year period, and a ten year data set has been developed for the National Park Service on fish, habitat, and water quality. Stream restoration has been initiated to biologically control non-endemic fish species and reintroduction of native fish species. Management recommendations have been proposed to the National Park which include a continued assessment of water quality, continued monitoring for data collection, extension of the botanical surveys along stream riparian zones to identify current vegetation and determine presence of rare species, removal of all invasive and non-endemic species, and implementation of best management practices by preserving stream-side vegetation and maintaining stream-side management zones.

b. This research has provided data to better manage and restore native endemic stream fishes in currently biologically altered streams. Long-term data collection becomes an invaluable wealth of environmental information that can measure and track environmental changes due to impacts of the years. The data set at Vicksburg has illustrated significant increases in the water temperatures over the last ten years within two of the streams that may be due to a combination of climatic impacts on air temperature and landscape disturbances within the drainage that increased sediment loads. The long-term data gathered provides immediate evaluation of the ecology and environmental condition of the streams but also assist in decision making for future stream management at Vicksburg National Military Park.

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

d. Integrated Research and Extension

Key Theme – Forest Resource Management

a. Hurricane Katrina left many thousands of acres of timberland understocked and damaged. While many acres were completely destroyed and need to be cleared and replanted for maximum timber production, many thousands of acres could be managed to slowly regain full stocking. Even aged pine plantations make up almost all pine timber stands in the region, and Mississippi foresters rarely use alternative management tools. Few foresters have experience in using alternative silivicultural methods such as uneven aged management, patch clearcutting, and group selection. Department of Forestry Extension personnel conducted a workshop for the hurricane affected area on Managing Understocked Stands. USDA Forest Service personnel from the Crossett Experimental Forest were featured speakers at the program along with professionals in the Department of Forestry. The program was geared towards professional foresters to generate the greatest impact. These foresters manage over 2.5 million acres of land collectively.

b. According to the evaluations returned by attendees, the impacts of this workshop are significant. Acres managed by the attendees totaled 2, 533,353. They estimated the value of the program to be $1,383,500. We expect that the lands partially damaged by Katrina will be a significant part of the timber supply for the next few decades. Management skills in non-plantation management will be a necessary component of every management forester's array of tools.

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

d. Multi-State Extension

Key Theme – Natural Resource Management

a. Almost one-half of the forest area in Mississippi is in hardwoods. Although much of the hardwood area is more suitable for pine, many landowners wish to maintain the hardwoods, primarily for recreational purposes. However, the hardwood resource is generally not being managed as well as that for pine. Many resource managers do not have the basic information for best management of the hardwood resource. The Department of Forestry Extension staff has conducted 17 short courses and five hardwood management workshops to educate landowners on the management of their hardwood lands. The staff has also conducted 23 site visits to landowner properties and three radio programs to discuss hardwood management issues.

b. There is a direct economic impact to the landowners and the state of Mississippi when this resource is managed properly. Landowners will earn more income through recreational leases on their property and the state will generate high income through eco-tourism opportunities. Additionally, better management of the resource should result in better environmental conditions, an improvement in job opportunities, and an improvement in recreational opportunities.

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 under each listed after the PPA. An additional PPA emerged during the past year as Extension has played a major role in Disaster Relief due to the impact of Hurricanes Katrina and Rita. Each program is classified as either Integrated Research and Extension (IR&E), Research (MAFES), or Extension (MSU-ES).

4-H Youth Development
- Animal Handling and Care (MSU-ES)
- Children, Youth, and Families at Risk (MSU-ES)
- Citizenship (MSU-ES)
- Communication/Leadership (MSU-ES)
- Consumer and Family Science (MSU-ES)
- Environmental Education (MSU-ES)
- Healthy Lifestyle Education (MSU-ES)
- Plant Care (MSU-ES)
- Science and Technology (MSU-ES)
- Volunteer Development (MSU-ES)

Child & Family Development
- Children, Youth, and Families at Risk (IR&E)
- Child Care Giver Training (MSU-ES)
- Family Life Issues (MSU-ES)
- Master Family Life Educators (MSU-ES)
- Nurturing Homes Initiative (MSU-ES)
- Parenting Education (MSU-ES)

Enterprise and Community Development
- Business Development (MSU-ES)
- Community/Economic Development (IR&E)
- Governmental Training (MSU-ES)

Family Resource Management
- Termites/Structural Pests (IR&E)
- Children, Youth, and Families at Risk (IR&E)
- Consumer Education (MSU-ES)
- Family Financial Management (MSU-ES)

Horticulture
- Ornamental Plant Care (IR&E)
- Master Gardener (MSU-ES)

Leadership Development

- Leadership Skills Development (MSU-ES)
- Master Clothing Volunteers (MSU-ES)
- Mississippi Homemaker Volunteers (MSU-ES)

Wildlife/Fisheries

- Socio-Economic Investigations of Fish and Wildlife (MAFES)

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
4-H Youth Development	0	0	17	735,880
Child and Family Development	0	0	22	202,970
Disaster Relief	0	0	0	44,405
Enterprise and Community Development	0	0	1	159,781
Family Resource Management	0	0	2	87,042
Horticulture	13	0	6	142,762
Leadership Development	0	0	2	150,664
Wildlife and Fisheries	9	0	3	34,906

Overall Expenditures for Goal 5

Function	FTE	Expenditures*
Experiment Station	3.54	$1,752,711
Extension Service	156.40	$8,661,976

* 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 – Community Development

a. Trees serve a vital role in the sustainability of urban and community environments that include natural areas, and just as importantly, in low and high impact development areas. Trees and the associated vegetation can help alleviate a number of societal, environmental, and economic problems faced by our cities and towns. Trees in urban areas also take on new importance in retarding stormwater runoff, reducing constructed facilities costs, and improving environmental quality. As an example, Best Management Practices (BMPs) are non-engineered, stormwater management guidelines that can provide low cost savings to efforts aimed at reducing stormwater runoff and improving water quality. A number of urban forestry research and outreach-related efforts have been undertaken to address urban and community forestry in Mississippi. MSU's Forest and Wildlife Research Center has initiated three projects to study the status, needs, and knowledge levels of Mississippi communities to urban forestry; benefit/cost study of urban forest practices in small- to mid-sized cities in the Lower South using Hattiesburg, Mississippi as a model; and the development of a manual titled "Mississippi Urban and Community Forestry Management Manual."

b. All three studies have had a positive impact within Mississippi and beyond. The first study serves as a guideline to assist communities with funding opportunities, program information, and technical assistance to promote or initiate urban and community forestry activities. The second study developed key benefit/cost methodology to help communities determine the effectiveness of their urban and community forestry investments. The estimates from this study were also used by the Mississippi Forestry Commission to help determine the valuation of the loss in street trees from Hurricane Katrina. During this study a procedure was developed to estimate city street tree populations using GIS to determine optimum sample size. The continuation of this work will enable cities to undertake inventories of trees, crucial to determine benefit/cost ratios. The third effort resulted in a hard and compact disk version of the manual which has been well received. The manual has been presented as a possible tool to utilize during rebuilding of the Gulf Coast. With increased knowledge and implementation of urban and community forestry activities and programs, Mississippi's communities can take the lead in promoting economic, social, and environmental benefits for their citizens and the citizens of the State.

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

d. Integrated Research and Extension

Key Theme – Children, Youth, and Families at Risk

a. In the debate over the most appropriate approaches to use to reduce adolescent high risk sexual behaviors in the United States, more emphasis has been placed on understanding adolescents who report they have had sex than on understanding adolescents who report they have remained abstinent (Blinn-Pike, 1999). Not all individuals are sexually active in early adolescence and little

attention has been paid to understanding adolescents who remain abstinent longer than their peers. In addition, few studies have asked abstinent adolescents why they have not had sex. This study investigated why early adolescents reported they remained abstinent over an 18-month period. Their perceptions of why they remained abstinent are valuable data that need to be utilized in future research in order to begin to understand how to design developmentally appropriate and effective prevention messages for early adolescents.

b. The data from both the baseline and the 18-month waves revealed a critical need for early adolescents to receive anti-drinking messages along with messages about sexual abstinence. Pregnancy and HIV/AIDS prevention curricula rarely address abstinence from alcohol consumption as a strategy that can aid in delaying the initiation of sexual activity. Professionals in the fields of pregnancy and alcohol prevention need to work more closely together. This could be facilitated by changes in public policy, school organization, and funding to promote closer collaboration.

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

d. Integrated Research and Extension

Key Theme – Child Care/Dependent Care

a. Child care directors have tremendous opportunities to observe children's health environment and interact with parents/caregivers. Yet, this group of 'natural' observers (i.e., child care providers) has not been asked in a systematic way to give voice to their observations and practice wisdom, much less to be involved in nationally representative research studies. In addition, the literature is sparse in exploring and connecting pervasive issues of child care, such as the economics of child care and varying health status and expulsion rates of very young children, with respect to center type, region and other socio-economic variables. Two multi-state surveys of child care directors were completed and preliminary analyses begun. The first survey was administered to 2,753 child care directors in five states to determine their assessments of children's needs regarding health and well-being. In this survey, we also asked the following question, "Are you interested in exploring opportunities to partner with health professionals in conducting child health research at your center?" Approximately 51% responded positively to this question. Among the 51%, we conducted a subsequent random survey of 803 child care directors to learn about their centers' economic vulnerability and to gain an understanding of the circumstances surrounding the expulsion of young children, particularly as it relates to economics.

b. To date, we have published (in-house) a Chartbook of the first survey results and have presented these initial findings at a number of national meetings, including the 2005 National Head Start Association Meeting and the American Academy of Pediatrics and Academy Health/Child Health Research Meeting. In addition, drafts of two manuscripts are being completed, one for a pediatric journal and one for a Head Start journal. For the second survey, we have two Issue Briefs, one draft manuscript and three abstracts for national presentations. Furthermore, we are currently building a national database (approximately 200,000 licensed child care centers) to conduct (to our knowledge) the *first-ever nationally representative* survey of child care center directors on a myriad

of health, economic and well-being issues facing children, their families and child care professionals.

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

d. Multi-State Extension

Key Theme – Children, Youth, and Families at Risk

a. The unprecedented needs of children and families resulting from Hurricane Katrina continue to be ongoing. Initially, the acute needs of children within shelters were not known, and the numbers of school-age children who were potentially impacted by Katrina were not clear. Furthermore, the mental health needs of children and the need for ways to identify and create a system of health and mental health referral were and continue to be critical ongoing needs in the recovery and rebuilding phases. The Family & Children Research Unit (FCRU) conducted a statewide Mississippi Emergency Temporary Shelter Survey to gauge children's location and needs and, in conjunction with the Mississippi Chapter of the American Academy of Pediatrics (AAP) and the Mississippi Academy of Family Physicians, supervised the creation and dissemination of a Mental Health Screening and Referral Kit for physicians and child care professionals. Dr. Linda H. Southward also coordinated donations from FCRU-affiliated consortium members nationwide to fulfill the needs, as listed with the state AAP chapter, of Mississippi physicians treating children. She is currently coordinating a regional Katrina Summit to evaluate the first 150 days after Katrina, to be held in New Orleans, Louisiana and Biloxi, Mississippi. One of the primary goals of this summit is to determine unmet and ongoing health needs of children within the region. Drs. Arthur G. Cosby and Linda Southward are plenary speakers for the Katrina Summit. In addition, ongoing efforts for securing funding for longitudinal research and collaborative efforts continue with Columbia University's National Center for Disaster Preparedness, the Urban Institute and New York University School of Medicine's Center for Pediatric Emergency Medicine. This activity is intended to build upon Dr. Southward's contribution to an AHRQ-funded publication, entitled "Pediatric Terrorism and Disaster Preparedness Resource.

b. The Mississippi Emergency Temporary Shelter Survey results provided much needed information about the logistics and needs of children during evacuations. Also, two Issue Briefs were disseminated via the FCRU Web site, providing estimates of the numbers of affected children. This information has been useful in justifying allocation of resources for affected children. The Voices for America's Children in Washington, DC, which has worked toward legislation to benefit children affected by Katrina, has requested and utilized both the survey results and Issue Briefs produced by the FCRU. The Mental Health Screening and Referral Kit was issued to over 1700 child care centers, schools, professional groups and physicians' offices statewide for use by child care and child health professionals. This tool remains germane to child health needs. Numerous supplies and $2,500 reached the Mississippi AAP Chapter to assist the needs of affected children. Finally, the 150-Day Katrina Summit, co-sponsored by the SSRC and the American Academy of Pediatrics will result in a report on the needs of affected children, with anticipated widespread distribution and a call for conference of national significance.

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

d. Multi-State Extension

Key Theme – Community Development

a. Hurricane Katrina (2005) destroyed the infrastructure of the Mississippi Gulf Coast. All utilities such as, water, gas, sewer were severely damaged. Roads, phone service, cell towers were damaged or destroyed. Homes, businesses and public infrastructure were destroyed or damaged leaving thousands homeless or without jobs. The Gulf Coast counties in Mississippi were left in a devastated state with limited utilities and essentially no way to assess of the condition of infrastructure necessary to protect life and property during response and recovery operations. The GeoResources Institute (GRI) responded quickly to the disaster. Many employees with skills in geographic information systems (GIS) and remote sensing spent many weeks and sleepless nights at the Emergency Operation Commands on the coast and in Jackson. GRI was directly involved with the US Coast Guard directing chopper pilots to nearly 300 emergency rescues after the hurricane left the area.

b. Thousands of maps were produced immediately after the hurricane directing military, first responders and construction crews to devastated areas. Water, food and relief shelter maps were distributed to thousands. GRI is uniquely situated to help in the redesign of the Gulf Coast. Using remote sensing of before and after Hurricane Katrina you can see the patterns of destruction. By studying these patterns developers can plan the New Gulf Coast to better survive the next hurricane. Economic development will be stronger and more prosperous. The environment will be better protected by new designs for utilities to better withstand the forces of wind and storm surges. Socially, communities will become more vibrant as the new coast begins to take shape.

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

d. Integrated Research and Extension

Key Theme – Child Care/Dependent Care

a. With an estimated 57% of Mississippi's young children in unlicensed child care settings; it becomes vital to provide additional educational information and programs to providers in family home care. Through a collaborative effort between the Mississippi State University Extension Service and the Mississippi Department of Human Services, Office for Children and Youth, the Nurturing Homes Initiative (NHI) project provides educational programming and technical assistance to family home providers. In the five years of the project's existence, over 485 family home providers across the state have participated in the program, with a waiting list of 50. The program uses a nationally normed assessment tool, the Family Day Care Rating Scale (FDCRS), to assess the quality of childcare provided by the family home providers. As a result of the NHI program, significant improvements were made in the quality of childcare provided by all of the providers participating. Post assessment scores reveal that 82% of the providers scored above the

national median score of the FDCRS. The program, which is delivered through a unique distance education system utilizing a Web TV system and supported with printed educational materials and one-on-one technical assistance, provides training that is time efficient and economically feasible for family home providers.

b. Through funding from the Mississippi Department of Human Services, Office for Children and Youth, the Nurturing Homes Initiative (NHI) project provides educational programming and technical assistance to family home providers. In the five years of the project's existence, over 485 family home providers across the state have participated in the program, with a waiting list of 50 providers. Significant improvements have been made in the quality of childcare provided by all of the providers participating. During year four, post assessment scores reveal that 82% of the providers scored above the national median score of the Family Day Care Rating Scale.

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

d. Multi-State Extension

Key Theme – Youth Development

a. Leadership skill development and self-esteem are two critical components in youth development. The Health Rocks/Life Rocks program (designed to improve the decision making skills of youth) provided an opportunity to test the ability of teen mentoring/teaching to improve the leadership skills and self-esteem of older teens. The older teens (high school age) were recruited to provide the primary teaching and mentoring of younger youth (middle school age) during the implementation of the curriculum.

b. Pretest/posttest results using the Rosenberg Self Esteem Instrument and Blackwell's Leadership Skills Instrument (based on the curriculum, "Leadership Skills You Never Outgrow" show significant increases in both areas for the teens serving as teachers/mentors.

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

d. Multi-State 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.

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. This process has continued with the 16 PPAs established after restructuring.

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 3,233,752 total contacts made by Extension, 1,130,283 (35%) were made to African-American, Native-American, or other under-served populations. This percentage is almost exactly 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. Two additional programs were identified in the Plan of Work update. 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.

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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: __X__ Multistate Extension Activities
____ Integrated Activities (Hatch Act Funds)
____ Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006
Southern Extension & Research Activities	67,195.54	70,127.51	43,725.59	52,440.33	30,507.51	28,940.64	
Money and You	5,873.56	5,732.24	15,285.16	5,667.54	15,491.99	15,628.09	
Mid-South Fair	13,221.89	30,330.75	22,573.44	19,281.12	15,881.07	19,061.03	
Southern Reg. Middle Managers Conf.	5,973.00	9,789.92	5,585.38	2,139.07	1,917.97	1,931.68	
Southern Reg. Volunteer Leaders Forum	115,672.75	29,749.83	23,483.63	12,216.28	13,049.26	13,359.60	
Program Leadership Conference	40,495.01	43,495.19	40,346.28	23,838.18	22,028.74	22,061.14	
National 4-H Congress	26,725.25	22,819.95	34,145.01	28,037.74	25,275.08	23,063.71	
Tri-State Ministers Meeting	6,509.05	6,613.24	5,191.26	9,618.58	4,955.97	3,968.25	
MS-LA Family Matters Conference	51,604.09	10,849.15	14,796.88	3,608.09	11,765.45	11,843.81	
Franklinton Beef and Dairy Project	51,545.48	48,839.75	56,240.95	74,740.30	70,504.85	66,016.55	
Cotman Project	12,959.98	12,553.79	10,995.03	14,925.51	19,814.88	19,433.00	
Tri-State Soybean Forum	31,871.53	30,357.34	22,341.97	20,024.21	17,245.42	17,010.31	
Delta States Farm Management Group	1,181.62	10,951.45	7,212.01	6,359.09	12,824.41	9,619.39	
Beltwide Cotton Conference	9,426.63	2,737.86	2,885.82	2,575.61	7,805.23	7,520.66	
Southern Reg. Extension Animal Scientists	6,676.73	7,059.07	2,305.25	2,558.93	1,740.95	1,756.18	
Southern Forage & Pasture Improve. Conf.	4,925.84	0.00	1,213.80	1,208.38	1,247.51	1,257.41	
National Ext. Livestock Specialists Conf.	10,555.36	0.00	0.00	2,558.93	1,740.95	1,756.18	
Commercial Vegetable Recommendations	0.00	0.00	1,783.75	1,785.26	1,844.95	1,862.07	
Greenhouse Tomato Short Course	0.00	0.00	3,576.44	3,639.71	3,757.96	3,792.36	
National Catfish Database Committee	0.00	0.00	4,905.91	19,629.46	19,967.17	14,008.86	

National Extension Technology Conference	0.00	0.00	2,238.50	5,615.68	4,657.61	4,695.25	
S. Reg. Comm. on Pub. Affairs/Farm Mgt.	0.00	0.00	7,568.69	7,126.12	11,615.46	11,033.77	
Southern Comm. Development Institute	0.00	0.00	1,741.40	6,936.71	10,972.67	8,312.96	
Tri-State Fruit & Vegetable Growers	0.00	0.00	7,071.11	6,899.15	9,249.00	12,028.71	
MS-LA Blueberry Growers Conference	0.00	0.00	3,234.52	2,970.31	4,982.79	10,054.56	
Delta H.O.P.E. Tri-State Initiative						14,232.81	
Tri-State Workforce Initiative						0.00	
Total	**462,413.40**	**342,007.02**	**340,447.76**	**336,400.31**	**340,844.85**	**344,248.98**	

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.

Delta H.O.P.E. (Healthy Options for People through Extension) Tri-State Initiative – provides the implementation and evaluation of a classroom-based intervention that: 1) encourages short bouts of physical activity integrated with academic lessons (TAKE 10!), and 2) presents a cast of fun characters that help teach young children physiology and lifelong healthy behaviors through read aloud books, games, dolls, and informational videos (OrganWise Guys - OWG). The target population for this project is 30,000 students enrolled in grades K-5 and their teachers (n = 1,500) in the Mississippi Delta Region. The Mississippi Delta Region is defined by the Lower Mississippi Delta Commission as a 219-county strip along the Mississippi River in Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee (including counties served by the Delta NIRI).

Tri-state Extension Coalition Workforce Preparedness Program - Changes in technology and jobs make it hard for parents and teachers to help prepare young people for a workforce that is so different from the one the adults entered years ago. In the Mississippi Delta, which includes parts of Mississippi, Arkansas, and Louisiana, the problem is especially acute. Job options are limited, and youth there often grow up unaware of the wide range of employment opportunities available. The coalition provides opportunities for 8- to 12-year-olds to develop age-appropriate skills related to successful futures in the workplace. An existing national 4-H curriculum called WOW! (Wild Over Work) is delivered through adult-youth partnerships. This effort is conducted in collaboration with the Southern Rural Development Center multi-state initiative on workforce preparation.

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.

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Institution Mississippi State University
State Mississippi

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

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005*
Agribusiness						
Beef and Forage	278,963	371,445	108,025	92,639	65,850	
Catfish						
Corn	23,980	50,034	46,309	39,224	22,787	
Cotton	53,094	60,223	215,998	150,658	158,606	
Dairy			143,976	310,472	435,255	
Food and Food Products	425,342	307,201	277,235	279,633	165,828	
Forest Products						
Forestry						
Horticulture	170,218	133,758	117,238	15,736	26,686	18,650
Poultry and Products		12,211				19,227
Rice	10,815	16,801	47,637	64,502	73,387	
Safety						
Soybeans	1,073	9,877	4,601			
Swine						
Wildlife and Fisheries						
Agronomic Crops						584,759
Animal Science/Forages						275,952
Aquaculture						13,739

Environment/Nutrient Management						36,779
Risk/Farm Management						1,318
Nutrition and Food Safety						780
Total	**963,485**	**961,550**	**961,019**	**952,864**	**953,399**	**951,204**

Note: In programs with no amounts listed, integrated activity exists from non-federal sources.
***FY 2005 figures reflect changes in program descriptions as provided in the 2005-2007 Plan of Work Update.**

Form CSREES-REPT (2/00)

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Institution Mississippi State University
State Mississippi

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

Actual Expenditures

Title of Planned Program/Activity	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005*
Agribusiness	387,174.60	437,985.80	386,968.78	368,175.51	119,207.27	
Beef and Forage	288,624.99	232,441.97	394,553.32	256,637.50	521,430.58	
Catfish	71,862.72	100,967.05	77,210.11	113,103.68	134,415.34	
Corn	73,613.51	62,430.72	69,365.54	91,702.76	200,152.18	
Cotton	225,968.90	235,905.15	246,342.30	425,432.35	483,369.46	
Dairy	52,168.17	28,900.17	50,685.18	37,577.87	66,169.25	
Food and Food Products	37,140.07	24,296.79	24,951.99	37,827.20	43,866.12	
Forest Products	36,467.68	41,322.87	23,344.24	38,383.71	21,238.55	
Forestry	433,066.92	396,201.79	407,270.95	428,114.88	685,402.67	231,596.67
Horticulture	591,804.37	531,946.22	685,789.67	404,495.40	504,534.03	450,505.88
Poultry and Products	53,976.15	48,522.70	36,877.01	16,962.18	92,537.56	33,767.27
Rice	20,894.55	42,943.41	50,844.19	40,366.68	90,598.73	
Safety	45,512.75	63,989.25	122,336.87	51,954.23	20,357.08	
Soybeans	173,587.21	144,518.95	146,201.11	135,513.02	335,494.79	
Swine	49,417.67	26,482.71	16,514.06	29,643.66	73,728.09	
Wildlife and Fisheries	109,008.42	86,469.30	168,966.68	169,281.54	392,934.83	174,398.68
Agronomic Crops						426,641.49
Animal Science/Forages						226,862.39
Aquaculture						97,393.78

Environment/Nutrient Management						140,170.12
Risk/Farm Management						67,675.09
Nutrition and Food Safety						
Total	**2,650,288.10**	**2,505,324.87**	**2,908,222.00**	**2,645,172.17**	**3,785,436.53**	**1,849.011.37**

***FY 2005 figures reflect changes in program descriptions as provided in the 2005-2007 Plan of Work Update.**

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 Celle 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.