Mississippi State University

Plan of Work

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

Submitted by
Mississippi State University Extension Service
Mississippi Agricultural and Forestry
Experiment Station
Forestry and Wildlife Research Center
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Introduction

This Plan of Work is an integrated plan, encompassing the land-grant extension and research functions of Mississippi State University: the Mississippi State University Extension Service (MSU-ES), the Mississippi Agricultural and Forestry Experiment Station (MAFES), and the Forest and Wildlife Research Center (FWRC).

The MSU-ES provides research-based educational programs and information in agriculture and natural resources, 4-H youth development, family and consumer education and community resource development to improve the economic, social, and cultural well-being of all Mississippians.

The foundation mission of MAFES is the creation of knowledge through fundamental and applied research in the fields of science related to agriculture, food, natural resources, the natural environment, people, and communities. The focus of these research programs is on enhancing and/or developing economically efficient and environmentally acceptable agricultural production and processing systems. The goals are to provide safe, nutritious, desirable food and fiber products and processes for consumers as well as to assure that the businesses which comprise Mississippi's agricultural industry have the information required to remain competitive in a global marketplace.

The FWRC's four-part mission is to provide natural resource management systems which ensure the highest production of goods and services while protecting and improving the forest and aquatic environments; to develop harvesting and manufacturing technologies that promote the efficient use of our state's timber resources; to address specific problems and opportunities related to our forest and wildlife resources; and to analyze options for renewable resources management and use.

MSU-ES receives a Smith-Lever formula allocation of $6,048,063 or 18.82% of its total allocated budget. MAFES receives a Hatch formula allocation (including multistate research funds) of $3,851,695 or 12.89% of its total allocated budget. FWRC receives a McIntyre-Stennis allocation of $676,955 or 9.9% of its total allocated budget.

Planned Program Descriptions

Planned program descriptions are organized within 5 Federal Goals and 26 Priority Program Areas.

Federal Goals

Goal 1: An agricultural system that is highly competitive in the global economy
Goal 2: A safe and secure food and fiber system
Goal 3: A healthy, well-nourished population
Goal 4: An agricultural system which protects natural resources and the environment
Goal 5: Enhanced economic opportunity and quality of life for Americans

Priority Program Areas (PPA)

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

PPA: Beef & Forage

Issue Statement

As of January 1, 1998, there were 666,000 head of beef cows in Mississippi. The estimated value of beef cattle sold in 1997 was 195 million dollars (Mississippi Agricultural Statistics). The January 1999 statistics are not yet available, but these estimates are expected to decrease slightly. There are approximately 27,000 beef producers in Mississippi. Eighty-six percent of these producers own herds of less than 50 cows, but comprise 46% of the total beef cow inventory. The remaining 54% of the beef cows are owned by only 14% of the producers. Management levels range from very poor to excellent.

The most common production practice is the production of stocker calves, which are typically sold at weaning through local markets. Reproductive efficiency of beef cattle, as measured by average weaning weights and percent calf crops, is low and prevents cow-calf producers from obtaining maximum profits. Best estimates indicate weaning weights average between 400-425 pounds, with an average calf crop percentage between 68% and 72%. Current technology could raise these values to 525 pounds and 85%. This could mean additional revenue of $95 per cow. The industry impact would approach 65 million dollars.

There are approximately 4.4 million acres devoted to forage production in Mississippi. It is estimated that only one half of forage acres received any lime or fertilizer in 1998. Hay is harvested on approximately 650,000 acres with an average yield of 2.5 tons per acre. The 1997 estimated value of hay production was $77.4 million dollars. Ryegrass or other winter annuals are planted on 350,000 acres yearly.

Based on discussions with producer groups and beef advisory councils, the following areas have been identified as priority needs: nutrition, genetic improvement, preventive herd health, marketing, forage management systems, forage varieties, and weed control.

Nutrition - A majority of producers do not take advantage of the ability to forage test harvested hay and silage fed during the winter months. As a result, they do not know the nutritive value of their feedstuffs. Nutritionally inadequate feeding programs prevent optimum reproductive efficiency and growth performance in beef cattle. This, in turn, limits profit potential for producers. More research and educational programs are needed on feed supplements and alternative, low-cost forages.

Genetic Improvement - Many producers do not maintain and utilize adequate production and financial records. These records are essential for efficient culling, selection of replacements, purchase of herd sires, and making management decisions. More research and educational programs are needed on genetic improvement for value-based marketing and appropriate crossbreeding programs. The Integrated Resources Management (IRM) program should make a significant impact in this area.

Preventive Herd Health - Most producers do not have a planned annual herd health program. Health and parasite control programs can correct existing health problems and reduce potential

for future difficulties. A herd health program administered at the proper time would have a positive economic impact on beef production in Mississippi and would positively impact marketing.

Marketing - The majority of beef cattle produced in Mississippi are sold through local auction markets. This practice relegates the producer to accepting whatever the current daily price may be. Marketing research and producer education needs to be explored to evaluate more profitable marketing options.

Forages - Forage varieties and grazing systems need to be developed to allow producers more total grazing days per year. This would allow them to be less dependent on expensive harvested forages. Also, research and educational efforts need to be directed at animal waste management programs that would utilize forage to capture nutrients and prevent run-off.

Resources Allocated

MSU-ES: 25.46 FTE, $1,813,231 Total
MAFES: 11.63 FTE, $3,875,370 Total

Beef and Forage - Alternative Marketing

Performance Goals

1. Increase producers selling in uniform truckload lots with uniform health programs.
2. Promote retained ownership through stockering and finishing
3. Increase preconditioning
4. Increase vaccination programs
5. Breed ID & source verification (conception through consumption)

Output Indicators

- Publications
- Producer meetings
- Retained ownership projects
- Extension programs

Outcome Indicators

- Producer Participants
- Number of head sold through alternative marketing methods
- Improved profitability

Key Program Components

- Alternative Markets
- Field Days
- Farm-to-Feedlot Project
- Stocker Grazing Program

Internal and External Linkages

Multi-State

- Integrated Resource Management (IRM)
- National Cattlemen and Beef Association

- Southeast Pride
- Beef Improvement Federation
- Strategic Alliances
- Marketing Cooperatives

Target Audiences

- Cow/Calf Producers
- Stocker Operators
- Feeders

Program Duration

- Intermediate

Education and Outreach Programs

- Farm-to-Feedlot Project (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Stocker Grazing Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Beef and Forage – Forage Improvement

Performance Goals

Cattle Producers will improve forage production by selecting:

- Improved Forage Crops
- Improved Grazing Management
- Proper Fertilization and Waste Utilization
- Improved Weed Control
- Development of improved forage crops

Output Indicators

- Experiment Station and Extension Service Publications
- Meeting with Producers (i.e. County Cattlemen's Assoc.)
- Field Days and Grazing Land Conservation Initiative Field Days
- Journal and Magazine Articles
- Number of In-service/Course Evaluations/Attendance
- Number of Samples Submitted - Forage Analysis
- Attendance at Field Days and Response
- Soil Testing

Outcome Indicators

- Number of producers submitting forage samples before and after program
- Comparison of winter-feeding costs before and after program
- Comparison of calf weaning weights before and after program
- Comparison of number of producers using weed control before and after program
- Improved soil fertility as indicated by soil tests
- Increased in the number of acres seeded to improved forages

Key Program Components

- Forage Variety Evaluation Publications
- Forage Testing Program
- Waste Utilization/Nutrient Management
- Agent/Conservationist Training

Internal and External Linkages

Multi-State

- USDA Forage & Waste Management Unit
- NRCS- Grazing Land Conservation Initiative
- National Cattlemen and Beef Association
- Beef Improvement Federation
- Dairy & Beef Program (Franklinton Project)

Target Audiences

- Beef Cattle Producers
- Stocker Operators
- Mississippi Cattlemen's Association
- Hay Producers
- Forage Producers

Program Duration

- Intermediate

Education and Outreach Programs

- Forage Variety Evaluation Publications (Statewide program)
- Forage Testing Program (Statewide program)

Beef and Forage - Genetic Improvement

Performance Goals

- Increase number of producers in IRM
- Increase number of producers in Farm to Feedlot Project
- Increase % of cattle in Farm to Feedlot Project grading choice
- Increase number of bulls in BCIA Sales
- Increase number of producers using performance tested bulls
- Improve ability to participate in value-based marketing
- Increase use of Animal Reproduction Techniques (Artificial Insemination, Embryo Transfer, etc.)
- Defined breeding season

Output Indicators

- Producers participation
- Producers meetings
- Beef Cattle short courses
- Research Projects
- Carcass ultrasound - Live Animal
- Calving season length

Outcome Indicators

- IRM performance records
- Carcass ultrasound - Live animal
- Improvement in cow herd/calf crop uniformity
- Defined breeding/calving season
- Feedlot records

Key Program Components

- IRM record keeping
- Farm to Feedlot Project
- Carcass evaluations
- Performance evaluations
- Beef Cattle Improvement Association sponsored sales

Internal and External Linkages

Multi-State

- IRM - Grazing Land Conservation Initiative
- Southeast Pride
- Beef Quality Assurance/Auburn University
- Southern Pasture & Forage Crop Improvement Conference
- Regional Research Projects

Target Audiences

- Cow/Calf Producers
- Stocker Operators
- Purebred Breeders
- Feeders

Program Duration

- Intermediate

Education and Outreach Programs

- IRM record keeping (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Farm to Feedlot Project (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- BCIA sponsored sales (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Beef and Forage - Herd Health

Performance Goals

1. Increase use of recommended herd health programs
2. Enhance profitability of cow/calf operations

Output Indicators

- Publications
- Producer Meetings

- Producer Participation
- Research Projects
- In-Service Training

Outcome Indicators
- Economic Returns
- IRM/Standardized Performance Analysis
- Farm-to-Feedlot mortality/morbidity
- Producers developing herd health calendars

Key Program Components
- Producer Extension Programs
- Field Days
- South East Pride
- Farm to Feedlot Marketing Program
- Performance Evaluation
- Stocker/Grazer Program

Internal and External Linkages
Multi-State
- National Cattlemen and Beef Association
- Beef Improvement Federation
- South East Pride
- IRM - Grazing Land Conservation Initiative

Target Audiences
- Cow/Calf Producers
- Stockers
- Feeders
- Alliances
- Auction Operators/Order Buyers

Program Duration
- Short (program participation)
- Intermediate (improved herd health)

Education and Outreach Programs
- Southeast Pride (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Farm to Feedlot Marketing Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Beef and Forage – Nutrition

Performance Goals
1. Increase number of producers testing forages
2. Increase number of producers using forage testing to determine winter supplemental needs

3. Increase number of producers using IRM to measure feed cost and production efficiency/reproductive efficiency
4. Increase efficiency of heifer & bull development
5. Efficiency of stocker programs
6. Increase proper mineral supplement
7. Evaluation of alternative feed stuffs and byproducts
8. Cow nutrition & efficiency
9. Waste management & feeding

Output Indicators

- Agents & Producers requests for ration formulation
- Producers Participation
- Producer Meetings
- Beef Cattle Short Courses
- Research Projects
- Publications Developed
- In-service Training

Outcome Indicators

- Number of samples submitted - Forage hay/silage tests & Feed samples
- Feed cost comparisons using IRM
- Forage samples submitted after program
- Production Efficiency (Standard Performance Analysis)

Key Program Components

- Forage Testing
- Beef Producer Programs
- Ration Recommendations
- Beef Quality Assurance
- IRM/SPA

Internal and External Linkages

Multi-State

- Dairy & Beef Program (Franklinton Project)
- NRCS- Grazing Land Conservation Initiative
- IRM
- National Cattlemen and Beef Association
- Beef Improvement Federation
- Southern Regional Research Projects

Target Audiences

- Cow/Calf Produces
- Stocker Operators
- Feeders

Program Duration

- Intermediate

Education and Outreach Programs

- Forage Testing (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Ration Recommendations (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Beef Quality Assurance (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Catfish

Issue Statement

Aquaculture is the fastest growing segment of U.S. agriculture, and farm-raised catfish accounts for most of the aquaculture production in the United States. Mississippi leads the nation in catfish production with 100,000 acres of ponds currently producing over 72 percent of the nation's farm-raised catfish. The production and processing of catfish, with its associated service industries, contributes in excess of 2 billion dollars to the Mississippi economy annually. Its value is expected to increase as per capita consumption of fish continues to grow. Although catfish production is at a record level and growing, at this stage in the industry's evolution there are significant problems that potentially constrain its continued development. Information gathered from meetings with industry advisory groups have identified numerous areas that need attention, and led to the agreement that Mississippi State University should focus its research and extension programs in the areas listed below. Research in these areas should include not only the biological aspects of the problem, but also the economic impacts of the problems and their solutions.

Water Quality - Algae-related off-flavors, oxygen depletions, and other water quality problems cost Mississippi catfish producers millions of dollars a year. Methods of managing pond water quality need to be developed for more efficient and profitable production and to reduce the impact of catfish farming on the environment.

Fish Health - Losses due to disease outbreaks can be catastrophic and account for millions of dollars in lost production annually. Management strategies for controlling the impact of infectious and non-infectious diseases affecting catfish need to be developed.

Nutrition - Feed cost represent at least 50 percent of the variable operating costs associated with farming catfish. Development of least cost feeds, optimization of nutrient utilization, a better understanding of nutrition and fish health interactions, and improved feeding strategies are essential to the continued growth of the industry.

Harvesting Technology - Revenues are reduced because of inadequate harvesting techniques, which have changed little since the inception of the catfish industry. Methods to improve efficiency of catfish harvesting and grading are needed.

Fish Behavior - Very little is known about the behavior of catfish in ponds because the fish are not visible except during stocking, harvesting, or feeding. Behavior of pond-raised catfish and the relationship between behavior and environmental factors, feeding, and fish health needs to be determined so that the effectiveness of new management practices can be fully evaluated.

Food Quality and Safety - Recent headlines of foodborne human illness and associated product recalls, lawsuits, and regulations demonstrate substantial risk to continued growth of the catfish industry. Efforts are needed to characterize human pathogens found on catfish products and to develop and provide training for implementing effective control measures for human pathogens and pesticides.

Processing Technology - The continuing growth of the industry is combined with a shortage in available labor in many areas. A coordination of efforts between industry, equipment vendors,

and other resources is needed to develop and assist in implementing continuous processing improvements.

Resources Allocated

MSU-ES: 2.84 FTE, $257,000 Total
MAFES: 13.32 FTE, $5,915,027 Total

Catfish - Processing Technology

Performance Goals

1. Increase the probability of success of new or expanding catfish processing operations by providing up to date technological, operational, economic, and industry information.
2. Improve the technology development processes by providing the economic basis for evaluating new catfish processing technologies.
3. Improve the catfish complex (production, processing, and distribution) effectiveness by developing a processing economic model for use in an integrated system model.

Output Indicators

- Publications
- Computer model to provide the capability to analyze the economic impact of technology, other production and processing changes, and location and distribution issues

Outcome Indicators

- Feedback from potential and existing catfish processors, economic developers and other parties on the validity and usefulness of the information
- Use of processing information and models in the implementation of new technologies and other improvement steps

Key Program Components

- Define operating and cost characteristics for different catfish processing capacities.
- Identify resources available to the industry.
- Define present and future industry infrastructure needs.

Internal and External Linkages

Multi-State

- Processing, feed mill and rendering facilities (MS,AL,AR,LA,NC)
- Resources Available-Extension, Laboratories, etc. (MS,AL,AR,LA,NC)

Multi-Institutional

- Equipment capabilities (equipment vendors), facilities (architects/engineers)
- Health and Safety Considerations (MS Dept. of Health)
- Environmental Considerations (MS Dept. of Environmental Quality)

Multi-Disciplinary

- MSU Food and Fiber Center
- MSU Department of Agricultural Economics

Target Audiences

- Potential and existing catfish processors
- Economic developers

Program Duration

- Short (new or expanding catfish processing operations)
- Intermediate (economic basis for evaluating new catfish processing technologies; processing economic model for use in an integrated system model)

Education and Outreach Programs

- None

Catfish - Fish Behavior

Performance Goals

1. Establish that sonar can be used to size and count catfish in production ponds.
2. Establish that sonar can be used effectively in catfish production ponds to evaluate management practices.
3. Determine the relationship between ambient noises and catfish behavior in production ponds.
4. Determine the energy cost associated with catfish swimming against currents created by aeration equipment.
5. Establish reproductive behavior of various strains of catfish.
6. Determine reproductive behaviors to increase fingerling production.

Output Indicators

- Number of experiments conducted.
- Number of publications.

Outcome Indicators

- Use of sonar to help manage catfish production ponds.
- Methods adopted by catfish industry.
- Success of behavior studies and reproduction success in catfish strains.

Key Program Components

- Sonar calibration and verification experiments.
- Use of sonar to study the effects of normal production practices on fish behavior.
- Characterize the water flume produced by aeration equipment.
- Capture and analyze ambient noises in catfish ponds.
- Swim tunnel studies to evaluate energy expenditures by catfish due to water current.
- Catfish breeding behavior evaluation.

Internal and External Linkages

Multi-State

- Catfish Farmers of America

Multi-Institutional

- National Center for Physical Acoustics, University of MS

Target Audiences

- Catfish producers

Program Duration

- Short (sonar for sizing; sonar for management; ambient noises and fish behavior; fish energy costs of aeration)
- Intermediate (reproductive behavior; fingerling production)

Education and Outreach Programs

- None

Catfish - Fish Health

Performance Goals

1. Increase catfish producers' income through decreasing catfish losses due to disease.
2. Improve disease resistance of catfish stocks.
3. Enhance and improve disease detection methods.
4. Decrease catfish disease through appropriate intervention programs, i.e., chemical, antibiotic, and vaccines.
5. Enhance understanding of immunological and non-immunological disease resistance mechanisms of catfish.
6. Enhance understanding of the etiological agents causing major diseases in catfish.
7. Economic analysis of disease management of programs.

Output Indicators

- Publication
- Number of producers participating in extension programs and disease surveys

Outcome Indicators

- Disease records from catfish diagnostic labs
- Producer disease survey
- Sampling of fish populations
- Field trials to confirm research results
- Compare disease resistance of catfish before and after gene selection.
- Number of producers using enhanced disease resistant catfish.
- Reliance of producers on catfish disease diagnostic lab for determination of diseases.
- Incorporation of intervention strategies by catfish producers.
- Percent reduction in specific diseases.

Key Program Components

- Gene discovery program.
- Intervention development and screening program.
- Catfish breeding initiative.
- Catfish immunology program.
- Catfish development and screening program.
  - Selection of catfish stocks
  - Catfish management programs
- Catfish disease monitoring programs
  - Study epidemiology of diseases

- Monitor disease outbreaks

Internal and External Linkages

Multi-State

- Catfish Farmers of America
- Private companies service the catfish industry
- Wildlife and Fisheries Service

Multi-Institutional

- National/international companies with potential research and development activities on catfish disease intervention and control
- USDA/ARS

Target Audiences

- Catfish producers
- Catfish Farmers of MS
- Catfish Farmers of America

Program Duration

- Short (catfish losses; disease resistance; disease detection)
- Intermediate (decrease diseases)
- Long (disease resistance mechanisms; etiological agents; economics of disease management)

Education and Outreach Programs

- Catfish management programs (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Catfish - Harvest Technology

Performance Goals

1. Increase catfish producers' income through improved seining and grading efficiencies.
2. Increase the ability of the producers to deliver size-specific fish to the processing plants.
3. Improve in-pond fish holding conditions.

Output Indicators

- Publications
- Training sessions for farmers

Outcome Indicators

- Acceptance of the new seining technology by catfish producers.
- Adoption of square-mesh seine technology by catfish industry.
- Willingness of commercial seine manufacturers to build square-mesh seines and holding socks.
- Use of in-pond catfish grader.

Key Program Components

- Development and evaluation of new seines and grading techniques.

- Development of methods to improve conditions under which fish are held in ponds during harvest.

Internal and External Linkages

Multi-Institutional
- National Marine Fisheries Service

Multi-Disciplinary
- Department of Agricultural and Biological Engineering

Target Audiences

- Catfish producers
- Catfish processors

Program Duration

- Intermediate (improved seining and grading efficiencies; size-specific fish; in-pond fish holding conditions)

Education and Outreach Programs

- None

Catfish – Nutrition

Performance Goals

1. Develop least cost feeds.
2. Optimize nutrient utilization.
3. Improve feeding strategies.
4. Improve fish health through nutrition.
5. Optimize carcass yield and nutrient composition of catfish through nutrition.
6. Reduce production costs through improved feeds.

Output Indicators
- Experiments conducted in ponds and in the laboratory.
- Publications.
- Comparison of net returns using alternative feed formulations.

Outcome Indicators
- Savings on feed realized by catfish producers.
- Number of feed manufacturers using the low cost feed formulas.
- Increase in catfish production per acre.
- Increase in net returns for commercial catfish producers.
- Obtain data on fish growth, feed efficiency, carcass yields, and body composition.
- Enterprise budget analysis.

Key Program Components

- Feed ingredient evaluation.
- Use of low protein diets and all-plant diets.
- Reduce the use of vitamin supplements.

- Reduce feed waste through better feeding strategies.
- Economic analysis of alternative catfish feed formulations.

Internal and External Linkages

Multi-State

- Feed Mills in Southeast United States (AL,AR,LA,TX)
- Stuttgart National Aquaculture Research Center (AR)
- USDA/ARS Fish Disease/Parasitology Lab, Auburn (AL)
- Southern Regional Aquaculture Center (AL,LA,TX,AR)
- Aquaculture Departments in Southeast US (AL,LA,TX,AR)

Multi-Disciplinary

- MSU Agricultural Economics
- MSU College of Veterinary Medicine
- MSU Food & Fiber Center
- MSU Wildlife and Fisheries
- Delta Western Research Center
- USDA/ARS Catfish Genetics Research Unit

Target Audiences

- Catfish producers
- Catfish feed manufacturers
- Catfish processors
- Scientific community

Program Duration

- Intermediate (least cost feeds; nutrient utilization; feeding strategies; fish health through nutrition)
- Long (carcass yield and nutrient composition; production costs through improved feeds)

Education and Outreach Programs

- None

Catfish - Water Quality

Performance Goals

1. Improve profitability of catfish farming through better oxygen management practices.
2. Improve profitability of catfish farming by reducing incidence of environment-related off-flavors.
3. Reduce the impact of catfish farming on the environment by developing improved effluent management practices.

Output Indicators

- Number of publications

Outcome Indicators

- Compare aeration costs before and after implementing new management practices.
- Compare incidence of off-flavor before and after implementing new abatement practices.

- Comparison of net returns occurring from current production practices and from improved practices.

Key Program Components

- Aerator evaluation and ecological modeling.
- Evaluation of existing blue-green algicides (copper products and diuron).
- New algicide screening and development.
- Evaluation of improved water-management practices.
- Economic analyses of water quality and effluent management practices.

Internal and External Linkages

Multi-State

- Southern Regional Aquaculture Center projects on off-flavor management (AL, AR, LA, TN, TX), algae management (AL,AR,GA,LA,NC,SC,TN), and effluent management (AL,AR,LA,NC,VA,TX)

Multi-Institutional

- USDA-ARS SRRC in New Orleans, LA
- USDA-NPURU in Oxford, MS

Multi-Disciplinary

- Department of Wildlife and Fisheries
- Department of Agricultural Economics
- Department of Agricultural and Biological Engineering

Target Audiences

- Mississippi catfish producers
- Mississippi catfish processors
- Federal and State environmental regulators

Program Duration

- Intermediate

Education and Outreach Programs

- None

PPA: Corn

Issue Statement

Mississippi's corn acreage has significantly increased since the "Freedom to Farm" government program became effective in 1996. This program has allowed producers to utilize corn in crop rotation systems to help raise total farm productivity, spread risk and distribute labor use. However, the increase in corn acreage has exposed many growers to a crop with which they are less familiar than traditional crops. Furthermore, decreasing government financial support has increased the need for crop management expertise in order to optimize profitability and minimize losses. Thus, the following issues are proposed to increase profitability and sustainability of corn production systems.

1. Evaluate productivity and profitability of corn in various cropping systems, especially crop rotations. This would involve different soil types, and irrigated and dryland cropping systems. Successful endeavors, limiting factors and failures should be identified and addressed.

2. Investigate and implement management techniques which allow more efficient, timely corn planting. This would involve tillage systems capable of influencing spring soil-engaging time, identification of the optimum corn planting window and relief from factors capable of reducing stand, such as pathogens and insect pests.

3. Evaluate new technologies, including transgenic hybrids, and help implement them in improved corn production systems. Examples include Bt insect resistant hybrids and many types of herbicide tolerant or resistant hybrids.

Resources Allocated

MSU-ES: 3.31 FTE, $233,154 Total
MAFES: 2.03 FTE, $935,551 Total

Corn - New Technologies

Performance Goals

1. Improve corn productivity, quality, and/or value
2. Increase pest control safety and performance
3. Reduce labor requirements

Output Indicators

- MAFES Corn production research
- Publications/presentations

Outcome Indicators

- Identification of strengths, similarities or weaknesses of new products
- Performance evaluation compared to conventional systems/products
- Crop/technology acreage estimates

Key Program Components

- Special Research Initiatives - Corn Production Research

- Variety Testing
- Corn production short courses
- In-service training
- Certified Crop Advisor training
- Electronic curriculum

Internal and External Linkages

Multi-State

- American Society of Agronomy
- Crop Science Society of America
- National Corn Growers Association

Multi-Institutional

- USDA Corn Host Plant Resistance Unit
- University Variety Testing Programs
- Mississippi Agricultural Industry Council
- Mississippi Association of Agricultural Consultants
- Mississippi Corn Growers Association
- Mississippi Farm Bureau Federation

Target Audiences

- Producers
- Consultants
- Dealers
- Commodity Organizations

Program Duration

- Intermediate

Education and Outreach Programs

- Corn production short courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Certified Crop Advisor training (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Corn - Planting and Establishment Systems

Performance Goals

1. Improve corn productivity
2. Improve timeliness and success of stand establishment
3. Alleviate planting constraints as an acreage limiting factor

Output Indicators

- Corn production research
- Publications/presentations
- Participation in professional conferences, advisory councils, etc.

Outcome Indicators

- Time of planting estimates
- Stand failure estimates
- Crop yield performance
- Crop acreage estimates

Key Program Components

- Special Research Initiatives - Corn production research
- Corn production short courses
- In-service training
- Certified Crop Advisor training
- Electronic curriculum

Internal and External Linkages

Multi-Institutional

- USDA Corn Host Plant Resistance Unit
- Mississippi Agricultural Industry Council
- Mississippi Association of Agricultural Consultants
- Mississippi Corn Growers Association

Target Audiences

- Producers
- Consultants
- Dealers
- Commodity Organizations

Program Duration

- Intermediate

Education and Outreach Programs

- Corn production short courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Certified Crop Advisor training (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Corn - Profitability of Cropping Systems

Performance Goals

1. Improve corn productivity
2. Improve soil properties
3. Increase pest control safety and performance
4. Reduce labor requirements

Output Indicators

- Corn production research
- Publications/presentations
- Participation in professional conferences, advisory councils, etc...

Outcome Indicators

- Crop yield performance
- Crop acreage estimates
- Cropping system/management practice surveys
- Economic analysis of cropping systems

Key Program Components

- Special Research Initiatives - Corn Production research
- Variety Testing
- Corn Production short courses
- In-service training
- Certified Crop Advisor training
- Electronic Curriculum

Internal and External Linkages

Multi-Institutional

- USDA Corn Host Plant Resistance Unit
- University Variety Testing
- Mississippi Agricultural Industry Council
- Mississippi Association of Agricultural Consultants
- Mississippi Corn Growers Association
- Mississippi Farm Bureau Federation

Target Audiences

- Producers
- Consultants
- Dealers
- Commodity Organizations
- Commodity Organizations

Program Duration

- Intermediate

Education and Outreach Programs

- Corn production short courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Certified Crop Advisor training (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Cotton

Issue Statement

Cotton has long been Mississippi's leading agronomic crop in economic value. Historically, Mississippi has been one of the top three cotton producing states in the U.S. Until recently, Mississippi ranked second in acreage behind Texas; third in yield per acre behind California and Arizona; and third in total bales produced behind Texas and California.
Eradication of the boll weevil in the Southeastern U.S. and the Freedom to Farm provisions of the 1995 Farm Bill has resulted in Georgia and other Southeastern states increasing their acreage, while Mississippi acreage has declined.

In 1995, 1.46 million acres of cotton were harvested with an economic value of $733,749,000 before an economic impact multiplier is applied. In 1996, harvested acreage declined to 1.12 million acres with a production value of $648,621,000. In 1997, Mississippi harvested 970,000 acres, the first time since 1983 cotton producers harvested less than 1.0 million acres, and only the fifth time since 1866. Even though the 1997 crop set a new yield per acre record, 901 pounds of lint per acre, total production value was only $612,326,000. In 1998, harvested acreage decreased to 940,000 and the production value dropped to $567,000,000. The reasons for these reductions are: increased production costs, increased difficulties in managing selected insect pests, depressed cotton prices and Freedom to Farm provisions of the 1995 Farm Bill which allowed growers to rotate to more easily grown commodities such as corn. In order for Mississippi cotton producers to remain competitively globally and with the rest of the cotton belt and meet environmental standards, they must adopt new techniques to improve efficiency and to reduce costs, while maintaining or improving yields. Some of these techniques include eradication of the boll weevil, use of transgenic varieties, development of pest management strategies for transgenic cotton and post boll weevil eradication efforts, conservation tillage, use of GPS/Remote sensing technology in precision farming, and adopt soil-water-pesticide-nutrient management strategies that will protect the crop and promote environmental stewardship.

The following objectives are proposed to address these issues:

- Conduct research to identify profitable and sustainable practices.
- Seek input from growers, Farm Bureau, Delta Council and National Cotton Council as to real local, regional and national issues.
- Conduct in field demonstrations to deliver new technology.
- Identify priority areas in cotton production for research and enhancement.
- Identify marketing opportunities and teach marketing/budget management.

Resources Allocated

MSU-ES: 12.56 FTE, $950,000 Total
MAFES: 26.98 FTE, $7,542,348 Total

Cotton - Best Management Practices

Performance Goals

1. Maintain or improve profitability and sustainability of cotton production systems.

2. Increase growers' awareness and adaptation of crop rotation, nutrient management, precision farming, and management.
3. Increase growers' awareness of the need for whole farm management to include long term goals and objectives.
4. Growers adopt new techniques to sustain production and enhance profitability. These include reduced tillage, crop rotation, utilizing transgenic technology, utilize remote sensing and site specific management and management of conventional tools in a timely manner.

Output Indicators
- Number of demonstrations
- Number of growers participation in extension programs
- Publications
- News Articles

Outcome Indicators
- Cotton Acreage Surveys
- Cotton Production Surveys
- Cotton Variety Planted Surveys

Key Program Components
- Demonstrations
- WWW, Grower Meetings, Newsletters, and Popular Press
- Publications
- Cotton Production Short Courses

Internal and External Linkages
Multi-Institutional
- Crop Protection Companies (BASF, DuPont, American Cyanamid, Zenneca, etc.)
- Mississippi Association of Agricultural Consultants
- Mississippi Agricultural Industry Council

Target Audiences
- Cotton Growers
- Consultants
- Industry Field Representatives

Program Duration
- Intermediate (profitability and sustainability of cotton production systems; awareness and adoption of crop rotation, nutrient management, precision farming, and management; whole farm management)
- Long (adoption of new techniques: reduced tillage, crop rotation, utilizing transgenic technology, utilizing remote sensing and site specific management)

Education and Outreach Programs
- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Conservation Tillage

Performance Goals

1. Reduction in soil loss and compliance with conservation provisions of the Farm Bill
2. Increase or maintain yields and reduce production cost under reduced tillage programs

Output Indicators

- Number of growers attending field days
- Number of growers attending grower meetings
- Number of Publications
- Number of growers trying reduced till cotton production

Outcome Indicators

- Acreage Reports
- Yield Demonstrations`

Key Program Components

- Long-term no-tillage cotton plots and demonstrations
- Cotton production meetings
- Multi media news and publications

Internal and External Linkages

Multi-State

Beltwide:

- Southern Conservation Tillage Conference for Sustainable Agriculture
- Conservation Tillage Cotton and Rice Conference
- Southern Branch ASA Meeting
- ASA National Meeting

Multi-Institutional

- USDA projects in tillage and erosion control

Target Audiences

- Cotton Producers
- Consultants

Program Duration

- Intermediate

Education and Outreach Programs

- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Disease and Nematode Management

Performance Goals

1. Maintain or improve the ability of producers to manage cotton diseases and nematodes using cost effective management techniques.
2. Provide more effective educational programs for producers on nematicides to minimize adverse environmental effects.

3. Cooperate with researchers to determine the relative effectiveness of nematicides.

Output Indicators
- Number of extension programs delivered
- Number of clientele participating in extension programs

Outcome Indicators
- Acreage treated or nematodes with nematicides
- Number of soil samples for nematode analysis and other samples for disease analysis
- Percentage of nematode samples with nematode populations above treatment threshold level
- Proportion of acreage from which soil samples collected for nematode analysis
- Yield comparisons

Key Program Components
- Cotton Disease and Nematode Management Educational Programs
- Cotton Disease and Nematode Management Research Demonstrations
- Nematode monitoring through field sample collection
- Nematode monitoring through evaluation of soil sample results obtained from Nematology Laboratory records
- Field monitoring of diseases

Internal and External Linkages
Multi-State
- Cotton Council
- Beltwide Cotton Nematode/Disease Survey Committee Contacts

Multi-Institutional
- Seedling disease and nematicide evaluations (3+ companies)

Target Audiences
- Cotton Producers
- Cotton Production Professionals (Consultants, Industry Field Representatives)
- General Public

Program Duration
- Intermediate (disease and nematode management: IPM and environmental)
- Long (cost-effective management cotton nematodes and diseases)

Education and Outreach Programs
- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Harvesting, Handling and Ginning

Performance Goals
1. Increase cotton producer profits with alternative production system.
2. Demonstrate the impact of new harvesting equipment on lint quality and spinability.

3. Improve lint quality and spinability through improved storage and ginning techniques.

Output Indicators
- Number of field demonstrations conducted
- Number of harvesters evaluated
- Number of publications developed and distributed
- Number of presentations made to cotton industry personnel
- Economic analysis of conventional and narrow row system(s)

Outcome Indicators
- Compare sample grades from conventional and narrow row fields.
- Number of producers adopting narrow row production systems.
- Market and mill price differential for conventional and narrow row indicating acceptance
- Acreage Survey planted to new systems
- Harvester types introduced/sold

Key Program Components
- Evaluation of Ultra Narrow Row Harvesting Equipment
- Monitor storage conditions and the resulting lint and seed quality.
- Identify techniques for improved gin performance and preserving lint qualities.

Internal and External Linkages
Multi-State
- Regional Ginners' Short Courses

Multi-Institutional
- National and Regional Ginners Associations
- National Cotton Council
- Cotton Incorporated
- Gin Equipment Manufacturers and Supplier
- Cotton Production Support Industries

Target Audiences
- Cotton Producers and Gin Personnel
- Cotton Industry Personnel

Program Duration
- Intermediate

Education and Outreach Programs
Regional Ginners' Short Courses (Multi-State program)

Cotton - Variety Evaluation and Selection

Performance Goals
1. Increase cotton producers' income through variety selection.
2. Increase growers’ awareness of cotton variety characteristics and potential.

3. Evaluate yield and quality potential of experimental and commercially available cotton cultivars, both conventional and transgenic.
4. Adoption of newer, higher yielding varieties with traits that meet their needs for sustained profitability.

Output Indicators

- Number of variety trials
- Number of cotton variety demonstrations
- Participation in extension programs
- Publications
- News Articles

Outcome Indicators

- Producer reports of income, yield, and adoption

Key Program Components

- Cotton Variety Trials (CVT)
- Cotton Variety Demonstrations
- Cotton Variety Trial Result Publications
- Cotton Production Short Courses
- Media: WWW, Grower Meetings, Newsletters, and Popular Press

Internal and External Linkages

Multi-State

- National Cotton Council
- Regional Variety Trials (USDA-ARS)

Multi-Institutional

- Cotton Seed Company (Delta Pine Seeds)

Target Audiences

- County Agents
- Cotton Growers
- Consultants
- Industry Field Representatives

Program Duration

- Intermediate

Education and Outreach Programs

- Cotton Variety Demonstrations (Statewide program typically offered at the multi-county level, offered in conjunction with commodity groups)
- Cotton Variety Trial Result Publications (Statewide program)
- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Weed Control

Performance Goals

1. Increase cotton profitability through reduced weed control costs and improved quality.
2. Improve knowledge base of weed management strategies in transgenic and conventional varieties.

Output Indicators

- Number of cotton weed control experiments.
- Number of extension programs delivered to clientele.
- Number of participants in extension programs.
- Number of extension and refereed publications.

Outcome Indicators

- Compare lint grass contamination samples before and after implementing transgenic varieties using Cotton Classing Office Reports.
- Number of participants in extension programs.
- Number of users of herbicide decision aid software.
- Number of confirmed populations of herbicide resistant weeds.

Key Program Components

- Develop weed management strategies using transgenic and conventional cotton varieties and educate clientele groups.
- Develop and field test herbicide decision-aid software and educate clientele groups on use.
- Limit spread of herbicide resistant weed populations.

Internal and External Linkages

Multi-State

- Delta Weed Workers Information Exchange (Arkansas, Louisiana, Missouri, and Tennessee)

Multi-Institutional

- Herbicide Evaluations (6-12 companies)
- Land Grant Institutions in the Southeastern U.S.
- (North Carolina, Georgia, Tennessee, and Alabama)

Target Audiences

- Cotton producers, private industry (cotton inputs)
- National Cotton Council and Cotton Foundation

Program Duration

- Intermediate

Education and Outreach Programs

- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Crop Price Rations and Risk Management

Performance Goals

1. Development of grower cost of production schedules.
2. Improve ability of growers to manage risk.

Output Indicators
- Percentage of growers participating in clubs
- Producer reports of adoption

Outcome Indicators
- County/Farm Marketing Survey

Key Program Components
- Cotton Short course
- Marketing Clubs
- Weekly Newsletters

Internal and External Linkages
Multi-State
- Development Beltwide Marketing Club Monthly Teleconference

Multi-Institutional
- Conduct seminar with FMHA and FSA
- Conduct seminar with Farm Bureau

Target Audiences
- Cotton Growers
- Agribusiness Farms

Program Duration
- Intermediate

Education and Outreach Programs
- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Marketing Clubs (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Irrigation

Performance Goals
1. Increase the awareness of good irrigation scheduling practices to enhance yields and reduce input costs.
2. Increase the use of good drainage practices and land forming to strengthen irrigation practices.
3. Increase the efficiency and reduce problems of current irrigation systems

Output Indicators
- Yield comparison data on demonstration fields
- Irrigation development

- Practices implemented

Outcome Indicators
- Yield changes and cooperator satisfaction with demonstrations
- New acres of cotton irrigation developed
- Practices adopted from recommendations
- Meeting attendance indicating interest in subject matter

Key Program Components

- On farm demonstrations.
  - Cotton Production Meetings, Short courses, and Irrigation Workshops.
- Enhance research in cotton irrigation.
- Farm visits with producers to address individual situations.

Internal and External Linkages

Multi-State
- Work with irrigation specialist from Arkansas, Louisiana, and the Missouri Boot Heel to identify practices that are successful on irrigated cotton
- Host an Irrigation Workshop that is typically attended by producers from Arkansas, Louisiana, Tennessee, and Missouri to transfer practices and research on irrigated cotton

Multi-Institutional
- Consultants
- YMD Joint Water Management District

Target Audiences

- Cotton producers
- Consultants

Program Duration

- Intermediate

Education and Outreach Programs

- Cotton Production Short Courses (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
  - Irrigation Workshops (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Cotton - Utilizing GIS/GPS in Production

Performance Goals

1. Growers adopt new technologies which can increase the efficiency of agrochemical usage while protecting the crop and promotion environmental stewardship
2. Develop cost effective strategies for using GPS/GIS and remote sensing
3. Increase grower knowledge in new technologies.

Output Indicators
- Number of publications

Outcome Indicators

- Number of producers using GPS/GIS, etc.

Key Program Components

- Refinement of GPS/GIS techniques for managing agrochemicals
- Evaluation of remote sensing techniques for their utility in managing spatial variability and identifying zones needing attention.

Internal and External Linkages

Multi-State

- Precision Agriculture Conference

Multi-Institutional

- NASA, USDA, State Universities participating in Mississippi Space Commerce Initiative

Target Audiences

- Producers
- Consultants

Program Duration

- Long

Education and Outreach Programs

- None

PPA: Dairy

Issue Statement

On January 1, 1999, there were approximately 375 commercial Grade A dairy farms in Mississippi milking 42,000 cows. During 1998, these dairies produced 581 million pounds of milk valued at an estimated $16.75 per hundredweight and the state's total value of milk production calculated to be $97.3 million. Mississippi dairies employed about 1,500 workers and generated almost $410 million of total economic activity in the state and region. Only 105 of the 375 dairies in Mississippi utilizes the Dairy Herd Improvement Association (DHIA) data collection and management system to provide cow health, production, and reproductive information to dairy farmers.

The typical dairy milks 120 large breed cows and utilizes a pasture-based, corn silage and dairy feed concentrate feeding regime. This farm employs three farm workers in addition to the dairy owner/manager to carry out in milking, feeding, and forage production activities. In 1998, the average annual milk output per cow was 13,500 pounds compared to 10,300 in Louisiana and 12,100 in Arkansas.

Discussions with producers advisory groups, county agents and dairy industry personnel have identified five areas of concern for Mississippi dairies: (1) nutrition; (2) mastitis control; (3) facility management/cow comfort; (4) reproductive management; and, (5) cost of production.

Nutrition -- Since feed cost account for about 50% of total production cost, this is an important emphasis for educational programs and research projects. The development of improved forage varieties, low cost grazing systems and improved forage management systems will enhance profitability.

Mastitis Control -- Mastitis is a disease that exists in various degrees in every dairy herd in Mississippi. Mastitis influences the cow's ability to produce milk, and negatively influences the quality of milk. Effective mastitis control and management can increase milk production, lower production costs, and improve dairy farm profitability.

Facility Management -- Dairy cow comfort can be greatly improved in the summer by lowering temperatures through effective dairy facility management. Milk producers need to know how to properly utilize cow-cooling devices to enhance dairy profits. Most dairy facilities in Mississippi also fail to provide adequate cow comfort in bedding areas.

Reproductive Management -- Dairy herds in Mississippi suffer reproductive problems due to difficulties encountered when attempting to breed cows, especially during hot summer weather conditions. Both detection of estrus and conception rate are problems throughout the year, but become severe problems during the summer. These reproductive problems cause calving intervals to lengthen which reduces milk productivity of the dairy herd.

Cost of Production -- Dairy farmers generally do not know how much it cost to produce a hundredweight of milk and this information is very important in effectively managing a dairy. Dairy farmers need to be advised and convinced that proper record keeping is vital to effective cost management and enhancing dairy farm profits.

Resources Allocated

MSU-ES: 3.85 FTE, $327,231 Total
MAFES: 4.53 FTE, $4,512,303 Total

Dairy - Cost of Production

Performance Goals

1. Increase dairy producers' income through improved resource management.
2. Improve the dairy managers/operators' knowledge of production expenses and revenues to control seasonally volatile cash flows.
3. Educate dairy farmers of the need to maintain proper financial record keeping ensuring effective cost management and enhancing dairy farm profits.
4. Provide budgetary and financial information to producers, bankers and others to aid in decision-making for various dairy investments.

Output Indicators

- Number of extension programs delivered to dairy producers and related dairy industries
- Number of experiments conducted in estimating the costs and benefits of various cultural practices, equipment and technology used in producing milk
- Number of dairy producers and related dairy service industries personnel participating in extension programs
- Publications (dairy enterprise budgets, research bulletins, extension fact sheets, and newsletter articles)
- Number of referred articles published from research activities

Outcome Indicators

- Number of dairy producers using Dairy Enterprise Planning Budgets as a tool used in the decision-making process.
- Compare seasonal financial requirements and needs of dairy producers before and after implementation of dairy budgeting and cash flow management techniques.
- Percentage of dairy farmers utilizing Dairy Herd Improvement records as a method to collect production performance data and related financial records.
- Number of bankers and related dairy industries employing Dairy Enterprise Planning Budgets in evaluating investment alternatives and financial solvency.

Key Program Components

- Annual Mississippi Dairy Enterprise Planning Budgets for various sizes of typical dairy operations in the state
- Workshops for dairy producers of the use and value of dairy budgets in the management of their dairy farms
- Costs of production articles in the monthly MSU-ES Dairy News: Marketing and Management newsletter
- Extension agent in-service training on the use of the annual Mississippi Dairy Enterprise Planning Budgets
- Workshop for bankers and lenders of how to use and interpret annual Mississippi Dairy Enterprise Planning Budgets

Internal and External Linkages

Multi-State

- Southern Regional Dairy Extension and Research Activity (SERA-IEG 15) -- AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, TX, and VA
- Southeast Dairy Economist Group -- GA, LA, MS, NC, and SC
- Southern Dairy Conference -- AL, AR, FL, GA, KY, LA, MS, NC, OK, SC, TN, and TX

Multi-Institutional

- Dairy Technology Evaluation (Monsanto)
    - Dairy Waste Handling System Evaluation (various equipment firms)

Multi-Disciplinary

- Dairy Waste Management (Animal and Dairy Science, Plant and Soil Science, Agricultural and Biological Engineering, and Agricultural Economics)
- Cost of Production Budgets (Animal and Dairy Science and Agricultural Economics)
- Recycling Bedding Materials in Dairy Free stall Barns (Animal and Dairy Science, Agricultural and Biological Engineering, and Agricultural Economics)

Target Audiences

- Producers
- Dairy handlers and processors
- Lending institutions
- Private industry (pharmaceuticals, feed/nutrient and equipment firms)

Program Duration

- Intermediate

Education and Outreach Programs

- Annual Mississippi Dairy Enterprise Planning Budgets for various sizes of typical dairy operations in the state (Statewide program)
- Workshops for dairy producers of the use and value of dairy budgets in the management of their dairy farms (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Dairy - Facility Management

Performance Goals

1. Increase milk production during periods of heat stress.
2. Reduce mastitis and Somatic cell count levels.
3. Improve reproduction by lowering days to 1st service, days open, calving interval and thereby increasing milk production.

Output Indicators

- Number of Extension Meeting, Field Days, and "Walk Through" participants.
- Number of Farms making facility enhancements.
- Number of Publications/Fact sheets
- Number of Research Trials

Outcome Indicators

- Mississippi Health Dept. Milk Quality Data.
  - Compare pre and post-adoption records.
- Number of producers with heat abatement technology.
- Standardized 150-day milk comparisons.
- Somatic cell count comparisons using DHIA data.
- Days open, Days to 1st service and calving interval comparison from DHIA data.

Key Program Components

- Enrollment on the Dairy Herd Improvement Assn.
- Heat Abatement Training (Producer and Agent In-service)
- Dairy Facility "Walk Through" evaluations
- Field Days, Dairy Extension Programs, Dairy Management Conference
- Research Project: The feasibility of recycling the sands-solids mixture from a solids settling basin for use as bedding material in a dairy free stall barn.

Internal and External Linkages

Multi-State

- Dairy & Beef Program (Franklinton Project)
- Dairy Records Management Systems (35 States)
- Research Project -- Stress factors on farm animals and their performance. W-173

Multi-Disciplinary

- MSU College of Veterinary Medicine
- Farm Services Agency

Target Audiences

- Dairy Producers

Program Duration

- Intermediate

Education and Outreach Programs

- Enrollment on the Dairy Herd Improvement Assn. (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Heat Abatement Training (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Dairy - Mastitis Control

Performance Goals

Lower somatic cell counts in producer milk to an average of 450,000 per ml.
Lower bacteria counts in producer milk to an average of 50,000 per ml.
Develop an inexpensive and efficient automatic system to identify cows with mastitis as they are milked.

Output Indicators

- Number of experiments conducted in mastitis control
- Number of extension programs delivered to producers

- Extension and Research publications
- Number of producers attending educational programs.

Outcome Indicators
- Quality Evaluations from Mississippi State Health Department
- Quality Reports from handlers and processors
- Trends in DHI records in somatic cell counts and mastitis cases.
- Survey producers and determine changes in milking procedures and other mastitis prevention techniques.
- Results of research or collaboration with private companies.

Key Program Components
- Producer educational programs on mastitis control and lowering bacteria counts
- DHIA herd management screening
- Mastitis control articles in Dairy News: Marketing and Management
- Research on bedding material
- Statewide Dairy Field Day

Internal and External Linkages
Multi-State
- Mississippi Louisiana Dairy Management Conference (MS,LA)
  - Dairy Records Management Systems (35 States)
- PCDART workshops (MS, LA)
- Research Project -- Stress factors on farm animals and their effects on performance (W-173)
- Southern Extension and Research Activity-Information Exchange Group (SERA-IEG 15)

Target Audiences
- Dairy Farmers, supporting industries

Program Duration
- Intermediate (somatic cell counts; bacteria counts)
- Long (mastitis identification)

Education and Outreach Programs
- DHIA herd management screening (Statewide program)
- Statewide Dairy Field Day (Statewide program offered in conjunction with commodity groups)

Dairy – Nutrition

Performance Goals
1. Increase the use of higher quality forages and other feedstuffs on dairy farms thereby increasing milk production.
2. Increase the use of forage testing and ration balancing on dairy farms.
3. Develop and evaluate low cost grazing and forage management systems, along with forage supplements and determine how they can improve calf and heifer development and improve milk production in adult animals.

Output Indicators

- Number of experiments conducted in forage feeding, concentrate feeding , and forage management
- Number of extension programs delivered to producers
- Number of producers participating in extension programs and field days
- Publications (research reports, information bulletins, and dairy newsletters)
- Number of refereed articles from research projects
- Number of forage samples submitted for analysis.

Outcome Indicators

- Use of high quality forages, feed ingredients, and forage management practices.
  - DHIA milk production changes.
- Producer use of forage testing laboratories and expertise for ration balancing.
- Success in development of low cost grazing and forage management systems and forage supplements in improving heifer growth rates and improving milk production.

Key Program Components

- Dairy Nutrition Workshops
- DHIA herd management screening
- Nutrition articles in Dairy News: Marketing and Management
- Research on forage systems
- Research on potential energy/protein sources and feeding systems for lactating dairy cows
- Statewide Dairy Field Day

Internal and External Linkages

Multi-State

- Mississippi Louisiana Dairy Management Conference (MS,LA)
  - Dairy Records Management Systems (35 States)
- Research Project -- Stress factors on farm animals and their effects on performance (W-173)
- Southern Extension and Research Activity - Information Exchange Group (SERA-IEG) 15

Multi-Institutional

- Feed Trials (Church and Dwight, Monsanto, Arm and Hammer, ADM)
- Grazing Trials (Monsanto, Wax Seed Company)

Multi-Disciplinary

- Research Projects listed above involve ADS, Agricultural Economics Dept., College of Veterinary Medicine, Plant and Soil Sciences Department, MS Branch Exp. Stations, and private farms.

Target Audiences

- Dairy Producers, private industry (dairy inputs)

Program Duration

- Intermediate (use of higher quality forages; increase in forage testing)
- Long (low cost grazing and forage management systems)

Education and Outreach Programs

- Dairy Nutrition Workshops (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- DHIA herd management screening (Statewide program)
- Statewide Dairy Field Day (Statewide program offered in conjunction with commodity groups)

Dairy - Reproductive Management

Performance Goals

1. Increase dairy farmer income by reducing calving interval thereby increasing production per cow per year.
2. Improve estrus detection and conception rate on dairy farms
3. Increase the use of artificial insemination (AI) especially in heifers.

Output Indicators

- Number of experiments conducted in reproductive physiology
- Number of extension programs delivered to producers
- Extension and Research publications
- Number of producers attending educational programs.

Outcome Indicators

- Use DHIA data and compare calving interval, days open, conception rate and other reproductive parameters before and after program initiation.
- Survey producers and determine changes in reproductive management and use of DHIA records.
- Survey semen suppliers and determine changes in sales and observe DHIA records.

Key Program Components

- Reproductive Management Workshops
- DHIA herd management screening
- Reproduction articles in Dairy News: Marketing and Management
- Heat detection publication
- Research Projects
  a. The effect of induced early cycling on postpartum recovery and fertility
  b. Factors affecting corpus luteum development and function as related to fertility during the summer.
  c. Managed breeding alternatives for dairy heifers.
d. Statewide Dairy Field Day

Internal and External Linkages

Multi-State

- Mississippi Louisiana Dairy Management Conference (MS,LA)
- Dairy Records Management Systems (35 States)
- PCDART workshops (MS, LA)
- Research Project -- Stress factors on farm animals and their effects on performance. W-173

- Southern Extension and Research Activity - Information Exchange Group (SERA-IEG) 15

Multi-Disciplinary

- Research Projects listed above involve ADS, Agricultural Economics Dept. MS Branch Exp. Stations, and private farms.

Target Audiences

- Dairy Farmers, supporting industries

Program Duration

- Intermediate

Education and Outreach Programs

- Reproductive Management Workshops (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- DHIA herd management screening (Statewide program)
- Statewide Dairy Field Day (Statewide program offered in conjunction with commodity groups)

PPA: Forestry

Issue Statement

Mississippi is a forested state. Approximately 18.6 million acres or 62 percent of the State's total area of 30 million acres is forested. Fertile forest soils combined with the warm, humid climate result in highly productive forest lands. The forest lands of Mississippi are among the most potentially productive forest lands in the United States. These lands support ecologically complex forests, both hardwood and coniferous, which can be sustainable at high levels of output when properly managed.

The forests of Mississippi are owned predominantly by private organizations and individuals. Almost 90 percent of Mississippi's forests or 16.6 million acres are privately owned. Further, 13.4 million acres of the State's forestland is owned by small nonindustrial private landowners.

As a group, private nonindustrial forest (PNIF) owners include farmers, business and professional people, manufacturing employees, and retirees. More than 128,000 PNIF ownerships exceed 20 acres and range up to 5,000 acres or more. The average ownership is less than 80 acres. The typical PNIF forest is producing less than half the potential of a fully stocked natural stand. The productivity differential is even greater when compared to an intensively managed forest.

Mississippi's forest products manufacturing industry has an annual output of $11.4 billion. PNIF lands provide almost 60 percent of the raw material that supplies the industry. A reasonable 50 percent increase in productivity of PNIF land would result in new capital investments by wood-using industries ultimately increasing total industry output by $3 billion annually.

Through research, technology transfer, and targeted extension programs, we can insure the environmental integrity of our forests while realizing the economic benefits of intensive management. Managed forests can provide wildlife habitat, protect soil and water, offset carbon emissions, and contribute other aesthetic and recreational benefits.

The priority issues addressed by the current forestry program have been identified by use of a departmental advisory committee, needs assessment surveys, and trends documented in current literature. These include:

- Forest regeneration
- Forest management
- Forest protection (from insects and diseases)
- Timber harvesting and transportation
- Profitable management and production systems
- Environmental concerns

Resources Allocated

MSU-ES: 23.45 FTE, $1,666,231 Total
MAFES: 0.87 FTE, $148,198 Total
FWRC: 8.00 FTE, $1,615,528 Total

Forestry - Forest Resources Management and Use

Performance Goals

1. Increased forest landowners' productivity through new knowledge and technologies.
2. Increased logging operator effectiveness, efficiency, and profitability through new knowledge and technologies.
3. Increased understanding of the values of the forest and its products by youth, underserved clientele, and the general public through new knowledge and technologies.

Output Indicators

- Number of extension programs delivered.
- Number of publications produced and distributed.
- Number of refereed journal articles.
- Number of research proposals submitted.

Outcome Indicators

- Number of participants in extension programs.
- Number of acres of forestland influenced.
- Number of logging companies and employees influenced.
- Economic impact on commercial forestry.
- Status of forest health and long-term productivity.

Key Program Components

- Research investigating the biological relationships that influence forest regeneration, productivity, and health; the quantitative aspects of estimating forest characteristics including inventory; growth and yield; the legal, economic and managerial aspects of people and their institutions related to forestry and forest use; and the assessment of forest operations within the context of profitability and sustainable forestry.
- Technology transfer to constituent groups.
- Extension education on subjects essential to forest landowners and logging contractors including curriculum development, inservice education, proactive programming, and youth development activities.

Internal and External Linkages

Multi-State

- Regional research in tree improvement with university cooperators in Louisiana and Florida and with several large companies in the forest products industry.
- Regional forest operations research with 100 cooperators in 18 states.
- Regional spatial information technologies research with federal agencies and companies in the forest products industry.
- Regional extension projects coordinated by the regional extension forester.
- National extension initiatives coordinated by the National Program Leader - Forestry.
- State, regional, and national Linkages with forest industry through the American Forest and Paper Association (AF&PA) Sustainable Forestry Initiative.

Multi-Institutional

- Regional research in tree improvement with university cooperators in Louisiana and Florida and with several large companies in the forest products industry.
- Regional forest operations research with 100 cooperators in 18 states.
- Regional spatial information technologies research with federal agencies and companies in the forest products industry.

- Regional extension projects coordinated by the regional extension forester.
- National extension initiatives coordinated by the National Program Leader - Forestry.
- State, regional, and national Linkages with forest industry through the American Forest and Paper Association (AF&PA) Sustainable Forestry Initiative.
- Local educational projects in cooperation with the Mississippi Forestry Association, the Mississippi Forestry Commission, and other state and federal agencies.

Multi-Disciplinary

- Regional spatial information technologies research with federal agencies and companies in the forest products industry.
- Regional extension projects coordinated by the regional extension forester.
- National extension initiatives coordinated by the National Program Leader - Forestry.
- State, regional, and national Linkages with forest industry through the American Forest and Paper Association (AF&PA) Sustainable Forestry Initiative.
- Local educational projects in cooperation with the Mississippi Forestry Association, the Mississippi Forestry Commission, and other state and federal agencies.

Target Audiences

- Small and large forest landowners.
- Firms in the logging industry.
- Organizations such as the Mississippi Forestry Association, County Forestry Associations, and the Mississippi Loggers Association.
- County, state, and federal government agencies.
- Members of the public including youth and traditionally underserved groups.
- The scientific community.

Program Duration

- Intermediate

Education and Outreach Programs

- Forestry Short Course (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Logger Education Program (certification program) (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- 4-H Forestry Project (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Horticulture

Issue Statement

The horticulture industry in Mississippi encompasses vegetable and fruit production, turf, floriculture, and the ornamental nursery industry. Together, these components are valued at over $2.4 billion: vegetables ($65 million), turf ($2.2 billion), floriculture and ornamentals ($80 million), and fruits and nuts ($10 million). The majority of these firms (2,000+) are small family farms or family owned businesses, employing a total of over 25,000 people. Inconsistent production, due to weather or poor production practices, prevents consistent marketing. In order to obtain a consistent supply of quality product, growers need to be informed about research-based, successful production and marketing practices.

All areas of horticulture share similar research needs. Site selection, cultivar evaluations, and marketing strategies are common research areas across the board. Mississippi has three distinct climatic zones that preclude single site evaluations of production practices. Several factors must be employed in research and extension. These include the development of applicable and environmentally sound production practices; selection and development of cultivars suitable for production under Mississippi's environmental conditions; research, development, and distribution of cultural recommendations; and, at the state level, the encouragement of economic development in this area.

- Producers of horticultural products require a comprehensive research program involving all aspects of production practices with emphasis on Mississippi's environment. These include: reducing pesticide use via integrated pest management, nutrient management, cold hardiness, heat stress management, plant evaluations, plant growth regulation, propagation, and water quality.
- Develop cost and production analysis of the state's industry to determine the scope and impact on the state's economy. Information on cost analysis and financial management are critical to management.

Resources Allocated

MSU-ES: 21.47 FTE, $1,715,000 Total
MAFES: 4.88 FTE, $1,352,544 Total

Horticulture - Horticultural Crops

Performance Goals

1. Increase producer profitability by promoting cultural practices that are research based.
2. Improve marketing of horticultural crops.
3. Determine producer needs via interaction with commodity groups, grower meetings, etc.
4. Reduce economic and environmental impact of chemicals by implementing integrated pest management techniques in commercial production.
5. Increase production efficiency by decreasing labor requirements, i.e. mechanization, automation, etc.
6. Continue selection of appropriate varieties for local environments in Mississippi.

Output Indicators

- Research demonstrations conducted
- Number of published research papers - refereed journals, station bulletins, etc.
- Number of extension publications, trade magazine articles
- Number of producers participating in extension programs
- Number of grower meetings held
- Presentations at national and regional meetings

Outcome Indicators

- Surveys of what growers are doing (varieties, acres, etc.)
- Observe adoption of techniques and cultivars during farm visits
- Increase / decrease of horticultural operations
- Increase / decrease in sales volume

Key Program Components

- Review of horticulture publications
- Inservice Education
- Research:
  - fruit, field and greenhouse vegetable cultural practices
  - ornamental production practices
  - floriculture production practices
  - turf production practices
  - variety evaluation
- Curriculum development
- Mississippi Greenhouse Tomato Short Course
- Fall Garden Day

Internal and External Linkages

Multi-State

- Tri-State Fruit & Vegetable Growers Conference (MS, LA, and AR growers, MSU-ES, MAFES, MDAC, LSU-ES, AR-ES)
- Mississippi Greenhouse Tomato Short Course (growers in 15+ states participating, MSU-ES, MAFES, industry (exhibitors), national and international speakers)
- Mississippi Fruit & Vegetable Growers Association (growers, MSU-ES, MAFES, MDAC)
- Gulf States Horticultural Expo (MS, LA, AL)
- Mid South Greenhouse Growers Conference (MS, AR, LA)
- Southern Nursery Association (16 southeastern states)
- Southern Region of International Plant Propagators Society (southern region)
- S-103 (Technical and Economic Aspects of Ornamental Plant Production)
- SERA-27 (Regional Plant Evaluation Committee)
- IR-4 (minor use chemicals)

Multi-Institutional

- MS Peach Growers Association (MSU-ES and industry)
- MS Pecan Growers Association (MSU-ES and industry)
- Miss-Lou Blueberry Growers Association (Growers in MS and LA, MSU-ES, MAFES, USDA)
- 5 MS Turfgrass Association (MSU-ES, MAFES, industry)
- Mississippi Nurseryman's Association (MSU-ES, MAFES, industry)
- USDA National Arboretum

Target Audiences

- Commercial Growers of horticultural crops
- Part-time Growers of horticultural crops
- Horticultural Retailers
- Consumers
- Minority Vegetable Producers in Madison and Humphreys Counties

Program Duration

- Short
- Intermediate (cultural practices; marketing)
- Long (integrated pest management; production efficiency; variety selection)

Education and Outreach Programs

- Mississippi Greenhouse Tomato Short Course (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Fall Garden Day (Statewide program)

PPA: Poultry and Products

Issue Statement

Poultry production in the United States is increasing at a rate of 4 percent per year. In 1978, the average American consumed 87 pounds of beef, 47 pounds of pork, and 56 pounds of poultry. In 1997, per capita consumption was 67 pounds of beef, 48 pounds of pork, and 91 pounds of poultry. Poultry includes both broilers and turkeys. Americans are eating more poultry each year because it is perceived as having good taste, easy to prepare, healthy and nutritious, consistent in quality, and reasonably priced.

The poultry industry continues to develop and adopt new technologies. Poultry companies are continually adding automation and computer controls in their plants. Today's broilers have been selectively bred to produce meat for specific markets. Computers control the environments in many newer broiler houses by automatically turning on fans and heaters and raising and lowering curtains.

The Mississippi broiler industry is growing each year because of increased U.S. consumption and increased demand for exports. In 1997, Mississippi farmers produced more than 720 million broilers and passed North Carolina to become the fourth largest broiler producing state.

The Mississippi broiler industry affects many groups in the state. Small farmers grow broilers in Mississippi. Broilers are processed in Mississippi factories. Corn grown on Mississippi farms is a major ingredient in broiler rations. Mississippi construction workers are employed building broiler houses and processing plants. Broiler exports, especially through the ports of Gulfport and Pascagoula, create jobs for Mississippi truckers and longshoremen and generate income for stevedoring firms and state-owned ports. The broiler industry has a significant direct impact in more than half of Mississippi's counties.

The farm gate value of poultry in Mississippi for 1997 was about $1.4 billion, making it Mississippi's largest agricultural industry. About 2,555 farmers in 36 counties contracted with broiler integrators.

Almost all broilers grown in Mississippi are processed in Mississippi plants. Seventeen plants in Mississippi slaughter broilers. Very few broilers are sold as "whole birds" to the final consumer. Most undergo "further processing," which may include cut-up, de-boning, forming, marinating, breading, cooking, and specialty packaging. All slaughter plants do some

further processing. Some plants in Mississippi do only further processing.

In 1997, integrated poultry firms in Mississippi directly employed more than 18,200 people in processing, feed manufacture, and hatchery operation.

In addition to the broiler companies, a large egg producer, Cal-Maine Foods, is headquartered in Jackson. Cal-Maine has egg operations in Mississippi and at least 12 other states. The company's operations are fully integrated. It owns facilities to hatch chicks, grow pullets, manufacture feed, and produce, process, manufacture, and distribute shell eggs and egg products. The company currently is the largest producer and distributor of fresh shell eggs in the United States. Its major egg processing plant is in Jackson.

Based on discussions with management of integrated poultry companies, contract farmers, and others actively involved in the Mississippi poultry industry, the following needs have been identified:

- Data relevant specifically to waste management for broiler growers
- Management of broiler breeders to improve fertility
- Extension technical publications to provide critical information to growers and integrators
- Development of effective Coccidiosis vaccine
- Research to extend HACCP (especially related to Salmonella) from processing back into live production
- Processing yield as affected by nutrition and management
- Improved production efficiency in broilers
- Efficiency of equipment used by growers to minimize their costs

Resources Allocated

MSU-ES: 3.38 FTE, $330,154 Total
MAFES: 4.38 FTE, $1,346,232 Total

Poultry and Products - Reducing Malodor and Pathogens

Performance Goals

1. Reduce odors present in manure of chickens.
2. Reduce pathogens present in poultry meat.

Output Indicators

- Number of research publications

Outcome Indicators

- Reduction of malodor in chicken houses
- Reduction in incidence of specific pathogens on chicken meat

Key Program Components

- Determine impact of Lactobacilli on the growth of E. coli, Salmonella and Campylobacter in chickens.
- Determine effects of direct feeding organisms on malodor production in the chicken house.
- Determine the effects of direct feeding organisms on microbial ecology of the alimentary tracts and excreta of broilers.

Target Audiences

- Poultry Scientists
- Food Scientists
- Poultry Companies
- Research publications

Program Duration

- Long

Education and Outreach Programs

- None

Poultry and Products – Lipoproteins and Egg Mycoplasma

Performance Goals

1. Obtain a better understanding of effects of Mycoplasma vaccination on egg lipoprotein content.
2. Obtain knowledge of transmission of lipoproteins from hen to baby chick.

Output Indicators

- Number of research publications

Outcome Indicators

- Better F-Strain vaccine

Key Program Components

- Determine if correlation exists between blood and egg lipoprotein profiles of Mycoplasma vaccinated and non-vaccinated hens.
- Determine if effects on egg lipoprotein are carried through incubation and hatching processes into the chick.

Internal and External Linkages

Multi-State

- S-233 Regional Project - Currently Expired but being rewritten by cooperators.

Multi-Institutional

- Specific Cooperative Research Agreement with USDA South Central Poultry Research Laboratory

Target Audiences

- Poultry Scientists

Program Duration

- Long

Education and Outreach Programs

- None

Poultry and Products - Fertility in Broiler Breeders

Performance Goals

1. Increase fertility rate in broiler breeder flocks
2. Increase total hatchability of broilers.
3. Improve profitability of the poultry industry.

Output Indicators

- Number of publications
- Number of programs delivered
- Number of companies requesting assistance

Outcome Indicators

- Changes in equipment to allow environmental modifications in breeder houses
- Development of new analytical techniques to assess fertilization capability of males
- Educate producers about major reasons for infertility in broiler breeders

Key Program Components

- Determine and demonstrate effects of high environmental temperatures on fertility of broiler breeder males.
- Determine how to manage the environment in broiler breeder houses to provide maximum opportunity for fertile eggs to be laid.
- Deliver programs to poultry companies and growers to demonstrate the effectiveness of preventing heat stress related fertility reductions.
- Provide technical publications and information to teach producers how to predict fertility based upon technology being developed in this program.

Internal and External Linkages

Multi-State

- Collaborative research with private companies in CA and AR.

Target Audiences

- Poultry producers
- Poultry companies
- Manufacturers of sperm quality analyzers
- Mississippi Poultry Association

Program Duration

- Intermediate

Education and Outreach Programs

- Poultry Extension Education Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Poultry and Products - Access to Technical Information

Performance Goals

1. Provide Poultry Science Newsletter on a bi-monthly basis to industry and make it available over the web.
2. Publish technical publications through MCES for use by the poultry industry and other Universities that highlight important research completed at MSU and at South Central Poultry Research Laboratory.

Output Indicators

- Number of publications
- Number of requests for publications

Outcome Indicators

- Poultry industry, press and academia are better informed about what information is being generated for their use by MSU and South Central Poultry Research Lab

Key Program Components

- Hard copy newsletter mailed out
- 2.Newsletter on web site
- Make available hard copy and web based technical publications suitable for industry and which will be picked up by the poultry press to demonstrate what work is being done on poultry at MSU and at South Central Poultry Research Laboratory

Internal and External Linkages

Multi-State

- USDA South Central Poultry Research Laboratory

Target Audiences

- Poultry growers
- poultry companies
- poultry press
- general public

Program Duration

- Intermediate

Education and Outreach Programs

- Poultry Extension Education Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Poultry and Products - Cocci Vaccine Development

Performance Goals

1. Reduction of coccidiosis incidence in broilers
2. Increase health and productivity of broilers.

Output Indicators

- Number and quality of scientific and technical publications
- Number of presentations to poultry or scientific groups

Outcome Indicators

- Incidence of cocci in vaccinated broilers compared to other broilers.
- Scientific and industry interest in the project as demonstrated by requests for information.

Key Program Components

- Identification of the appropriate species of Coccidia that will generate the best vaccine.
- Determine how to propagate these protozoa in the laboratory.
- Determine what subunit of the protozoa will give the most resistance to the organism
- Determine what route of administration of the vaccine is most effective.

Internal and External Linkages

Multi-State

- Field trials will be conducted with several companies in several States.
- Trials will be conducted internationally.

Target Audiences

- Poultry vaccine companies
- Poultry Companies
- Poultry Producers
- Mississippi Poultry Association

Program Duration

- Intermediate

Education and Outreach Programs

- Poultry Extension Education Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Poultry and Products - Poultry Waste Management

Performance Goals

1. Increase the utilization of poultry litter through uses as a source of plant nutrients.
2. Identify new uses of poultry litter to provide opportunities for expansion of Mississippi's poultry industry.
3. Have the Mississippi poultry industry in compliance with waste management requirements
4. Improved water quality.

Output Indicators

- Number of poultry waste management programs delivered to producers.
- Comprehensive nature of data generated on poultry waste
- Number of Extension publications generated
- Number of workshops conducted.
- Number of peer reviewed research publications.
- Number of presentations made.
- Mississippi Poultry Association and Mississippi Farm Bureau evaluation of program.

Outcome Indicators

- Changes in litter handling practices by industry.
- New uses accepted for poultry litter.
- Changes in NRCS recommendations for waste management plans.
- Acceptance of poultry litter by crop and tree farmers.
- Improved water quality.

Key Program Components

- Determine accurate data for the nutrient content of broiler and broiler breeder litter from Mississippi farms and disseminate to NRCS, and broiler firms and growers in Mississippi.
- Determine economics of transportation and relocation of poultry litter and disseminate to broiler firms and growers in Mississippi.
- Determine and demonstrate alternate uses for poultry litter: composting, in-house amendments to litter, bio-remediation and forestry applications.

- Collaboration with NRCS to promote acceptance of data to use for waste management plans for poultry growers
- Poultry grower educational programs and workshops delivered at county level
- Extension publications
- Research publications

Internal and External Linkages

Multi-State

- Compare nutrient content of Mississippi broiler litter to that of Alabama, Georgia and North Carolina. Develop theories on why the nutrient content may vary, and what this could mean with respect to waste management plans. MOA to be developed.

Multi-Institutional

- U.S.D.A. South Central Poultry Research Laboratory specific cooperative agreement.

*Multi-Disciplinary **Linkages***

- Poultry Waste Management - Poultry Department, Forestry Department, Agricultural and Biological Engineering Department, State Chemical Laboratory, Animal and Dairy Science Department, Plant and Soil Science Department.

Target Audiences

- Poultry Growers
- NRCS
- Poultry Companies
- Crop farmers and forest landowners/or companies
- Mississippi Poultry Association
- Mississippi Farm Bureau

Program Duration

- Intermediate

Education and Outreach Programs

- Poultry Extension Education Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Rice

Issue Statement

Rice is the single most important food crop in the world and consumption in the United States continues to increase. In the past few years, rice acreage in Mississippi has averaged about 250,000 acres. Acreage in 1998 was 268,000 acres and is expected to increase to over 300,000 acres in 1999. The estimated value of rice produced in 1998 was about 150 million dollars. Rice production in the U.S. is expected to shift more toward the Mississippi River delta because of the inexpensive water source. The Delta area is highly suited to rice because of clay soils, abundant water and favorable weather. Based on discussions with rice consultants and producer groups, including the Mississippi Rice Promotion Board, six areas were identified as priority needs.

Varietal Development: About two-thirds of the rice acreage in Mississippi is grown in one variety, Lemont, which was released in the mid 1980's. Lemont is very susceptible to sheath blight and its straw strength appears to be weaker than when the variety was first released. The incidence of lodged rice has increased which makes harvesting more difficult and expensive. Even with the weakness of Lemont, rice producers have been reluctant to change to other varieties because they lack a complimentary package of agronomic and pest resistance characteristics.

Disease Control: Sheath blight caused by Rhizoctonia solani was a minor disease until the introduction of susceptible semidwarf rice varieties such as Lemont. Sheath blight has become the most prevalent disease in rice in Mississippi. Several fungicides have been registered for sheath blight control; however, data from over 50 field tests on rice grower fields have failed to provide a consistent return on investment. An average of 10 to 17 bushels per acre is required to provide an economical return on investment.

Weed Control: Controlling weeds continues to be one of the primary production problems of the rice producer. Weeds are estimated to reduce yields up to 17% in the Delta area of Mississippi. Propanil has become the backbone of rice weed control since its introduction in the early 1960's. However, barnyardgrass has become resistant to propanil on a limited acreage in Mississippi and it is expected to increase which could increase production costs. Weed control programs must be implemented to avoid widespread herbicide resistance.

Insect Control: Carbofuran, the only insecticide available for controlling rice water weevil larvae, was phased out of the market in 1998. No other insecticide will be available for larvae control, thus the adult water weevil will have to be controlled. This will be a totally different approach to water weevil control and will require extensive education of the rice growers and consultants to be effective.

Nutrient Management: Any number of factors may alter nutrient application timing and rates under actual farm situations. Nitrogen management is further complicated by new varieties, precision leveling of heavy clay soils, floodwater management, tillage, and disease and weed incidence. The need to efficiently conserve nitrogen and other nutrients is of special concern with the likely implementation of nutrient management regulations in the near future.

Water Management and Quality: With the potential for increased acreage and water use, water management and quality may become important issues involving non-point source pollution.

Resources Allocated

MSU-ES: 3.20 FTE, $218,538 Total
MAFES: 2.39 FTE, $1,508,764 Total

Rice - Insect Control

Performance Goals

1. Increase the knowledge and ability of producers and consultants to control insects in rice through integration of insecticides and resistant varieties into the overall rice management systems.
2. Reduce the potential for resistance to insecticides.
3. Increase insecticide regime choices to producers and consultants.

Output Indicators

- Number of experiments conducted in insecticides and varieties.
- Publications produced through insecticide screening trials and resistant varieties. (Research Bulletins and Journal articles)
- Number of industry research projects to evaluate new insecticide chemistry.

Outcome Indicators

- Number of consultants and producers utilizing research results of insecticide evaluations.
- Comparison of research information from other researchers in rice insect control.

Key Program Components

- Insecticide evaluation
- Resistant variety selection and identification
- Rice research program:
  - Insecticide management to decrease insect resistance.
  - Variety selection for insect resistance.
  - Insect management practices

Internal and External Linkages

Multi-Institutional

- Rice evaluations
- Insecticide evaluations (10-12 corporate sponsors)

Target Audiences

- Rice producers, consultants, and private industry

Program Duration

- Intermediate (insect control efficacy and effect on yield of insecticides; varietal tolerance and yield response to the rice water weevil)
- Long (reduce the potential insect resistance)

Education and Outreach Programs

- None

Rice - Management and Control of Diseases

Performance Goals

1. Evaluate high yielding and high milling rice varieties for disease resistance.
2. Define agronomic practices that can reduce disease incidence and severity.
3. Determine efficacy, affect on milling quality, return on investment and optimum rates and timings for new disease control fungicides.

Output Indicators

- Number of breeding lines and varieties evaluated
- Number of experiments conducted on fungicides
- Number of extension programs delivered to producers
- Number of hits on Internet site
- Publications

Outcome Indicators

- Numbers of acres grown in disease resistant varieties
- Number of acres sprayed with fungicide
- Comparison of yields and milling quality of sprayed vs. unsprayed acreage.
- Acceptance of recommended agronomic practices

Key Program Components

- Varietal and Breeding line screening for individual rice diseases.
- Fungicide evaluation including yield and milling quality.
- Identification of agronomic practices which reduce disease.
- Rice Growers' Extension Program:
  - Fungicide application practices
  - Posting of research results and control recommendations on Internet
  - Variety selection
  - Best agronomic practices

Internal and External Linkages

Multi-State

- Informal rice pathologists' information exchange and meeting (AR, LA, MS, TX)
- Uniform Regional Rice Nursery (AR, LA, MS, TX)
- Cooperative Research (Kernel Smut) (MS,AR)

Multi-Institutional

- Fungicide evaluations (7-12 companies)

Target Audiences

Rice producers, private industry.

Program Duration

- Intermediate

Education and Outreach Programs

- Rice Growers' Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Rice - Genetics, Breeding and Variety Development

Performance Goals

1. Increase rice producer's incomes through improved varietal production efficiency and market quality.
2. Provide growers with variety type options enabling them to utilize both conventional and emerging production technologies.
3. Develop improved varieties with increased resistance/tolerance to biotic and abiotic field stresses for enhanced production efficiency and minimize adverse effects ont he environment.
4. Improve quality and processing components required for general consumption and manufactured rice products.

Output Indicators

- Number of crosses made, early generation breeding nurseries evaluated, variety trials and screening tests conducted, and breeder seed production.
- Number of extension programs delivered to producers.
- Producer participation in extension programs
- Publications (variety trials, technical bulletins, rice grower guide)
- Publication of refereed articles (crop variety registration, research project findings)

Outcome Indicators

- Extent of variety adoption by producers from annual variety acreage surveys.
- Comparison of rice sample grades before and after introduction of new releases.
- Changes in types and amounts of crop production purchased and applied by growers and management practices.

Key Program Components

- Collection and evaluation of germplasm resources for donor traits.
- Parental identification and hybridization.
- Plant and line development.
- Comprehensive multiple-year and multiple-location, field, greenhouse, and laboratory evaluations of new experimental lines locally and regionally.
- Submission of release candidates to the MAFES Plant Materials Release Committee.
- Implement breeder seed production program.
- Rice Variety Trials publication
- Rice growers' extension program
  - Variety selection
  - Guidelines for management and production practices

Internal and External Linkages

Multi-State

- Uniform Regional Rice Nursery (AR, LA, TX, FL)
- Transgenic rice evaluations (LA)

Multi-Institutional

- Germplasm resources (USDA-ARS National Small Grains Research Facility, International Rice Research Institute, USDA National Rice Research Center)
- Rice variety evaluations (AgrEvo, American Cyanamid, rice mills/processors).

Target Audiences

Rice producers, millers, and processors

Program Duration

- Intermediate (evaluate germplasm; new breeding populations)
- Long (new experimental strains; seed purification and multiplication)

Education and Outreach Programs

- Rice Growers' Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Rice - Soil Fertility

Performance Goals

1. Increase the rice producer's income through improved efficiency of nutrient utilization.
2. Increase production while decreasing supplemental nutrient use and potential nutrient loss.
3. Improve the producers' ability to manage the interaction of nutrients and diseases.
4. Define optimum seeding rates for specific varieties to reduce seed costs.

Output Indicators

- Number of experiments conducted with varieties, nutrient management systems, and other cultural practices.
- Number of extension programs delivered to producers and/or consultants.
- Number of producers participating in extension programs and short courses.
- Publication (Variety trials, rice growers guide)
- Number of articles from research projects

Outcome Indicators

- Adoption of new varieties and modified nutrient management systems
- Changes in the level of fertilizer use on-farm compared to research needs
- Changes in acreage based on profitability of rice verses other crops

Key Program Components

- Variety by nutrient management field research
- Cooperative evaluation of breeding lines and nitrogen management
- Field evaluation of cultural management systems to decrease nutrient loss, maintain yields and decrease disease incidence, including the seeding rates component.
- Rice Growers' Extension Program
  - Nutrient management systems for specific varieties
  - Nutrient management plans to decrease field loss
  - Management of the interaction of diseases and fertilities
  - Optimum seeding rates for specific varieties.

Internal and External Linkages

Multi-State

- Variety by Nitrogen Interactions of new varieties (not a coordinated effort)
- Evaluation of various fertilizer products (different N sources or S materials)

Multi-Institutional

- Fertilizer Evaluations (Private companies)
- Variety X Nitrogen Management (Private varieties)

Multi-Disciplinary

- Breeding Line X Fertility Evaluations and Screenings
- Interaction of Nitrogen Disease incidence Severity

Target Audiences

- Rice producers, private industry, and consultants

Program Duration

- Intermediate (fertilizer management)
- Long (efficiency of nutrient use; development of new varieties)

Education and Outreach Programs

- Rice Growers' Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Rice - Weed Control

Performance Goals

1. Increase rice producers' income through improved sample grades.
2. Improve the ability of producers to control problem weeds by integrating transgenic and mutant varieties into rice production systems.
3. Limit the spread of herbicide resistant weeds.

Output Indicators

- Number of experiments conducted in varieties, herbicides, production systems
- Number of extension programs delivered to producers
- Number of producers participating in extension programs
- Publications (variety trials, rice grower guide)
- Number of referred articles from research projects

Outcome Indicators

- Compare sample grades before and after implementing transgenic and mutant varieties using data from local grain elevators.
- Number of producers using transgenic and mutant varieties based on information from variety/acreage study
- Percentage infestation of resistant weeds taken from county/farmer weed survey.

Key Program Components

- Rice Breeding Line Screening

- Transgenic and Mutant Varieties Identification
- Herbicide Evaluation
- Rice Growers' Extension Program:
  - weed management practices
  - variety selection
  - management for limiting spread of resistant weeds

Internal and External Linkages

Multi-State

- Regional Weed Competition Project S-183 (FL, AR, LA)
- Delta Weed Workers Information Exchange (AR, LA, MO, TN)
- Uniform Regional Rice Nursery (AR, LA, TX)
- Transgenic Rice Evaluation (LA)
- Allelopathic Research (AR)

Multi-Institutional

- Rice Variety Evaluations (AgrEvo, Cyanimid, Monsanto)
- Herbicide Evaluations (12-15 Companies)
- Allelopathic Research (USDA)

Target Audiences

- Rice producers, private industry (rice inputs)

Program Duration

- Intermediate (sample grades; transgenic and mutant varieties)
- Long (herbicide resistant weeds)

Education and Outreach Programs

- Rice Growers' Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Soybeans

Issue Statement

Soybeans occupy the largest row crop acreage in Mississippi (slightly over 2.0 million acres). Interest in improving soybean production is on the rise as growers are interested in advising higher yields and providing better management to their crop. With the introduction of freedom to farm, producers are using the practice of crop rotation. Improved crop production practices center around the use of new varieties, earlier planting dates, pest management systems, various tillage systems, improved irrigation scheduling, and better crop management.

The following objectives are proposed as avenues to address these issues.

- Conduct research to identify profitable practices.
- Conduct field demonstrations to confirm and promote research-based recommendations that increase profits.
- Identify areas of soybean production that need further evaluation.

Resources Allocated

MSU-ES: 8.11 FTE, $565,385 Total
MAFES: 4.10 FTE, $3,201,594 Total

Soybeans - Best Management Practices

Performance Goals

1. Increase the use of crop rotation
2. Encourage the adoption and use of the proper seed treatment for soybeans
3. Increase the use of yield enhancing treatments
4. Encourage producers to evaluate seeding rates

Output Indicators

- Number of programs delivered to producers
- Number of producers participating in programs
- Publications/Presentations
- Participation in Crop Conferences

Outcome Indicators

- Percentage increase in crop rotation
- Percentage increase in the use of proper seed treatments
- Percentage increase in the use of yield enhancing treatments
- Improvements in plant populations
- Crop yield performance

Key Program Components

- Research in production practices
- On-farm demonstrations
- SMART Extension Program

Internal and External Linkages

Multi-State

- Southern Soybean Conference
- Tri-State Soybean Forum

Multi-Institutional

- Company Evaluations
- Company Insecticide/Fungicide Evaluations

Target Audiences

- Soybean Producers
- Private Industry
- Consultants
- County Agents
- Soybean Commodity Groups
- General Public

Program Duration

- Intermediate

Education and Outreach Programs

- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Soybeans - Irrigation and Drainage Practices

Performance Goals

1. Increase use of irrigation scheduling practices on soybeans.
2. Increase yield of irrigated soybeans to a profitable level.
3. Increase use of good drainage practices on soybean fields.
4. Decrease use of inefficient irrigation practices on soybeans.

Output Indicators

- Number of requests for information.
- Number of cooperators in the SMART Program
- Attendance at meetings.

Outcome Indicators

- Yield increases and economic increases from better irrigation practices and scheduling.
- Increase in irrigated soybean acres.
- Requests to become involved in the SMART Program.

Key Program Components

- SMART Extension Soybean Program
- Field demonstrations and tours.
- Agent in service training.
- News articles and publications.

Internal and External Linkages

Multi-State

- Arkansas and Louisiana verification programs
- Irrigation Workshop

Multi-Institutional

- University of Arkansas and LSU research verification programs
- University of Arkansas Irrigation Workshop
- Soybean Promotion Board
- MAFES and USDA researches
- Soybean Promotion Board

Target Audiences

- Producers and consultants
- Out of state producers through University of Arkansas and LSU

Program Duration

- Intermediate

Education and Outreach Programs

- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Field demonstrations and tours (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Soybeans - Planting Dates and Variety Selection

Performance Goals

1. Increase the percentage of the state soybean crop planted early.
2. Increase the amount of acreage planted to the best varieties.

Output Indicators

- Number of programs delivered to producers
- Number of producers participating in programs
- Publications/Presentations
- Participation in Crop Conferences

Outcome Indicators

- Percentage of early planted acreage
- Percentage of acreage planted to higher yielding varieties
- The dollar value placed on using this technology by participants on-farm verification program
- Crop yield performance

Key Program Components

- Evaluate new varieties for their yield potential
- Evaluate new varieties for their disease/pest reaction
- Evaluate varietal response to different management systems.

- SMART Extension Soybean Program
- Field demonstrations and tours.

Internal and External Linkages

Multi-State
- Adjoining States Soybean Varietal Evaluation Trials (AR and LA)
- USDA Uniform Variety Trials
- Southern Soybean Conference
- Tri-State Soybean Forum

Multi-Institutional
- Monsanto Variety Trials
- Zeneca Trials

Target Audiences
- Soybean Producers
- Private Industry
- Consultants
- Soybean Commodity Groups
- General Public

Program Duration
- Intermediate

Education and Outreach Programs
- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Field demonstrations and tours (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

Soybeans - Site Specific Soybean Management (SSSM)

Performance Goals
- Use SSSM to increase profitability of soybean production.
- Improve the environmental stewardship of soybean producers.
- Understand how spatial variability of growth factors affects soybean yield.

Output Indicators
- Number of experiments conducted in site SSSM
- Number of extension programs delivered
- Acceptance of new technology
- Increase in environmental stewardship

Outcome Indicators
- Profitability before and after SSSM implementation
- Producer acceptance of SSSM
- Number of producers, dealers, extension agents

- Utilizing new technologies

Key Program Components

- Economic Advantages/Disadvantages of SSSM
- Variable Rate Chemical Applications
- Remote Sensing for Soybean Diagnostics:
  - Disease
  - Nutrition
  - Water
  - Weeds
- Evaluate new SSSM Technologies for Application to Soybean Management

Internal and External Linkages

Multi-State

Regional Precision Ag Projects S-289
American Society of Agronomy

Multi-Institutional

- Agrochemical Retailers (numerous)
- Private Consultants (numerous)
- Implement Manufacturers

Target Audiences

- Producers
- Agrochemical Dealers
- Private Consultants
- Soybean Commodity Groups:
  - MS Soybean Promotion Board
  - United Soybean Board
  - MS Soybean Association
  - American Soybean Association

Program Duration

- Intermediate

Education and Outreach Programs

- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Remote Sensing for Soybean Diagnostics (Statewide program)

Soybeans - Weed Control

Performance Goals

1. Improve weed control levels through combinations of technologies available.
2. Improve economic sustainability through reducing costs and improving levels of weed control.
3. Improve management of herbicide resistant weeds.

Output Indicators

- Experiments conducted in varieties, herbicides, and production systems
- Extension programs delivered to producers
- Producer participation in extension programs
- Publications
- Refereed articles

Outcome Indicators

- MSU-HERB acceptance and utilization
- SMART Program Acceptance
- Economic sustainability of herbicide-resistant varieties
- Producer utilization of herbicide-resistant varieties
- Area of infestation of herbicide-resistant weeds
- Number of producers, dealers, and Extension agents utilizing MSU-HERB

Key Program Components

- Incorporate glyphosate and glufosinate tolerance (as well as others as they are developed) into high-yielding commercial varieties with acceptable agronomic traits.
- Evaluate combinations of programs to optimize control and economics.
- Integrate weed management systems with soybean production.
- Determine levels of herbicide resistance in weeds as they occur.
- Evaluate combinations and herbicide rotation systems to minimize herbicide resistance.
- Implement MSU-HERB herbicide recommendation software statewide.

Internal and External Linkages

Multi-State

- Regional Weed Science Projects (s-286, S-183)
- Regional Soybean Variety Testing Programs
- Southern Weed Science Society Conference
- Southern Soybean conference
- Delta Weed Science Information Exchange Group
- USDA/ARS Germplasm Development Efforts
- Public Soybean Breeding Programs

Multi-Institutional

- Soybean Seed Companies (numerous)
- Herbicide Companies (numerous)

Target Audiences

- Soybean Producers, private industry
- Mississippi Soybean Promotion board
- Mississippi Soybean Association
- Agrochemical companies

Program Duration

- Intermediate

Education and Outreach Programs

- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- MSU HERB Herbicide Recommendation Software (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Swine

Issue Statement

In 1998, MS produced 433,370 pigs with a gross market value of $35.8 million (National Pork Board Check-off Report). Mississippi's inventory of hogs and pigs was estimated at 275,000 head on December 1, 1998. This reflects a 25 percent increase over 1997 and 28 percent over 1996. The number kept for breeding is estimated at 30,000 which is a 7 and 15 percent increase over 1997 and 1996, respectively. Pigs per litter in 1998, averaged 8.86 compared with 8.51 during 1997. There were 2000 farms with hogs in 1998 (Mississippi Agricultural Statistics). Total economic impact of all segments and related agribusiness of the swine industry for 1998 is estimated at $118 million

Independent pork production in Mississippi primarily consists of farrow to finish swine operations. Many of these producers feel pressured to increase size of operation to maintain market access and adopt new technologies to remain economic competitive. The majority of pigs produced in Mississippi are produced by company/contract production. This has been a growing segment of the swine industry but record low market prices and public concerns of environmental issues have discouraged additional growth.

Priority issues have been identified by input from the MS Pork Producers Association, County Agents and other producer advisory groups. Major areas identified include Environment/Odor; Marketing; Animal Health; Nutrition; Breeding and Genetics.

Environment/Odor is a national issue for pork producers. In Mississippi swine industry growth has been stopped due to Legislative and Regulatory actions. Public concern regarding swine waste/odor became an issue as a result of increased size, location and number of swine operations being constructed. Existing pork operations are faced with incorporating emerging waste/odor technologies at the producer's expense and a time of record low market prices. New cost effective technologies must be developed and transferred to the producer to sustain pork production.

Marketing of swine has changed dramatically over the past few years. Mississippi producers are fortunate to have a major packer/processor in state although alternative markets should be explored and developed. Producers need to keep and utilize production and financial records in order to compete in the global market.

Animal Health is a concern of pork producers. From a production standpoint, animal diseases decrease economic return and pose problems of carcass disposal. Other emerging issues involve food safety and the limitation of antibiotic use in swine production. Producers should be encouraged to participate in the national pork quality assurance program that addresses the on-farm HAACP concept of food safety and drug use. Preventative disease management along with production technologies such as segregated early wean pigs can assist producers with animal health issues.

Nutrition accounts for 60% of the cash cost of pork production. Nutritional programs that meet all nutritional requirements of genetically superior animals and incorporate concepts of reducing

environmental and food safety concerns must be provided to the producers in order to sustain economical production of pork.

Breeding and genetics play a vital role in pork production. Genetics establishes the limit and potential return on investment to the producer. Many issues are involved with breeding programs of a swine operation such as genetic selection, EPD's, artificial insemination, crossbreeding, reproductive performance and management.

Resources Allocated

MSU-ES: 2.44 FTE, $244,000 Total
MAFES: 1.76 FTE, $802,731 Total

Swine - Technologies and Management

Performance Goals

1. Sustain pork producers' production through improved management and use of new technologies.

Output Indicators

- Number of experiments conducted to develop technologies or management recommendations
- Number of extension programs delivered to producers
- Number of producers participating in programs
- Publications and resource materials developed

Outcome Indicators

- Number of producers that sustain pork production
- Changes in methods of production
- Increase in number of producers using computer technology

Key Program Components

- Evaluate methods to improve areas of management in nutrition, herd health, marketing, genetics and reproductive efficiency.
- Provide educational programs and resource materials to transfer technology to producers.

Internal and External Linkages

Multi-State

- National Pork Producers Council
- American Society of Animal Science
- Regional S-145 Committee
- American Swine Registry

Multi-Institutional

- Alcorn State University
- MS Department of Agriculture
- MS Pork Producers Association

Multi-Disciplinary

- Agricultural and Biological Engineering
- Agricultural Economics
- Animal Dairy Sciences
- Food and Fiber Center
- North MS Research and Extension Center
- Plant and Soil Sciences
- College of Veterinary Medicine

Target Audiences

- Producers
- University
- Industry
- State Agencies

Program Duration

- Long

Education and Outreach Programs

- Swine Producers Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Wildlife & Fisheries

Issue Statement

Mississippi is rich in wildlife and fisheries resources that are important to its heritage, culture and economic well-being. In 1996, state residents and non-residents aged 16 years and older spent $1.8 billion in consumptive and non-consumptive wildlife-related recreation. In the same year, 680,000 Mississippians (16 years or older) fished, hunted or watched wildlife. Most of Mississippi is either privately owned or industrial forest or agricultural land with a high potential for fish and wildlife production and management. Many landowners do not know how to manage their land properly for different species of these resources, and need current research-based information. Much of the state's 18.2 million acres of commercial and private forestland, 225,000 acres of small impoundments, 14,205 miles of streams and rivers, and 13 million acres of agricultural open lands is not managed for wildlife/fisheries. Additionally, opportunities for quality recreational experiences and/or additional revenue generation through development of wildlife/fisheries related enterprises exist on Mississippi land bases for property owners and resource stakeholders.

Sociological and demographic changes associated with increased urbanization and changing lifestyles, coupled with greater public demand for enjoyment of wildlife and fisheries resources, have led to new dilemmas in conservation issues, as well as user conflicts. These dilemmas are frequently compounded by increased public awareness and involvement in issues such as endangered/threatened species conservation, traditional hunting/fishing activities, environmental stewardship and quality of life, wildlife/fisheries population management, ecosystem restoration and habitat management, and agricultural and agroforestry intensification.

To address current and future challenges in wildlife and fisheries management, Mississippians need accurate and reliable information. This need can be met through well-designed and executed research, combined with pro-active, client-driven extension programming. Advisory and client input groups have helped identify the following priority/need areas:

- Development and refinement of management strategies for sustainable wildlife and fisheries resources
- Integration of fish and wildlife conservation with other land uses
- Impacts of intensive agricultural and agroforestry on wildlife/fisheries habitats and populations
- Economic impacts and business opportunities of wildlife/fisheries related activities
- Youth life-skills development through conservation and hunting/fishing education
- Adult education concerning fish and wildlife management on private lands
- Wildlife/human interaction and conflicts
- Continuing professional education

Resources Allocated

MSU-ES: 8.26 FTE, $622,923 Total
FWRC: 4.90 FTE, $1,217,065 Total

Wildlife & Fisheries - National Catfish Information Database (NCID)

Performance Goals

1. Provide readily available decision-making information to the catfish industry.
2. Improve information access and integration of information into daily decision processes within the catfish industry.
3. Provide a multi-media reference base on commercial catfish production to academic and industry support professionals and students.

Output Indicators

- Generation of Version 1 of NCID
- Approval by Catfish Producer Organizations in 4 states plus CFA Board Approval
- Demonstration of viability of the NCID concept through demand, use and application of NCID

Outcome Indicators

- Track sales and distribution of NCID product.
- Number of users of the WWW site.

Key Program Components

- A CD\ROM product made available to all catfish industry members.
- A WWW interface to serve the informational needs of the catfish industry.

Internal and External Linkages

Multi-State

- SERA-IEG 9 "Warmwater food animal production" (13 southern states: AL, AR, LA, MS, TX, FL, GA, SC, TN, KY, NC, PR, OK)
- NCID National Planning Committee (LA, AR, CA, TX, WI, KY, AL, GA, IN, MS, FL, VA, TN, ID, WA, OR, DC, VA)

Multi-Institutional

- Catfish Farmers of MS
- Catfish Farmers of AL
- Catfish Farmers of AR
- Catfish Farmers of LA
- Catfish Farmers of America
- USFWS
- USDA-CSREES
- USDA-APHIS
- USDA-APHIS-WILDLIFE SERVICES
- USDA-NASS
- USDA-ERS
- USDA-SEA GRANT

Multi-Disciplinary

- Subject Matter Scientists and Specialists from 37 different disciplines

Target Audiences

- Catfish Producers
- Catfish Processor
- Catfish Marketers

- Catfish Research and Extension Scientists
- Students

Program Duration

- Intermediate

Education and Outreach Programs

- Extension NCID Education Program (Statewide program)

Goal 2: A safe and secure food and fiber system

PPA: Catfish

Issue Statement

Aquaculture is the fastest growing segment of U.S. agriculture, and farm-raised catfish accounts for most of the aquaculture production in the United States. Mississippi leads the nation in catfish production with 100,000 acres of ponds currently producing over 72 percent of the nation's farm-raised catfish. The production and processing of catfish, with its associated service industries, contributes in excess of 2 billion dollars to the Mississippi economy annually. Its value is expected to increase as per capita consumption of fish continues to grow. Although catfish production is at a record level and growing, at this stage in the industry's evolution there are significant problems that potentially constrain its continued development. Information gathered from meetings with industry advisory groups have identified numerous areas that need attention, and led to the agreement that Mississippi State University should focus its research and extension programs in the areas listed below. Research in these areas should include not only the biological aspects of the problem, but also the economic impacts of the problems and their solutions.

Water Quality - Algae-related off-flavors, oxygen depletions, and other water quality problems cost Mississippi catfish producers millions of dollars a year. Methods of managing pond water quality need to be developed for more efficient and profitable production and to reduce the impact of catfish farming on the environment.

Fish Health - Losses due to disease outbreaks can be catastrophic and account for millions of dollars in lost production annually. Management strategies for controlling the impact of infectious and non-infectious diseases affecting catfish need to be developed.

Nutrition - Feed cost represent at least 50 percent of the variable operating costs associated with farming catfish. Development of least cost feeds, optimization of nutrient utilization, a better understanding of nutrition and fish health interactions, and improved feeding strategies are essential to the continued growth of the industry.

Harvesting Technology - Revenues are reduced because of inadequate harvesting techniques, which have changed little since the inception of the catfish industry. Methods to improve efficiency of catfish harvesting and grading are needed.

Fish Behavior - Very little is known about the behavior of catfish in ponds because the fish are not visible except during stocking, harvesting, or feeding. Behavior of pond-raised catfish and the relationship between behavior and environmental factors, feeding, and fish health needs to be determined so that the effectiveness of new management practices can be fully evaluated.

Food Quality and Safety - Recent headlines of foodborne human illness and associated product recalls, lawsuits, and regulations demonstrate substantial risk to continued growth of the catfish industry. Efforts are needed to characterize human pathogens found on catfish products and to develop and provide training for implementing effective control measures for human pathogens and pesticides.

Processing Technology - The continuing growth of the industry is combined with a shortage in available labor in many areas. A coordination of efforts between industry, equipment vendors, and other resources is needed to develop and assist in implementing continuous processing improvements.

Resources Allocated

MSU-ES: 2.84 FTE, $257,000 Total
MAFES: 13.32 FTE, $5,915,027 Total

Catfish - Food Quality and Safety

Performance Goals

1. Increase catfish food quality by developing methods to control microbial spoilage.
2. Survey catfish pre and post-harvest for potential human pathogens and harmful residues.
3. Develop rapid detection methods for biological and chemical contaminants of catfish.
4. Increase catfish food safety by developing intervention methods to control human pathogens and toxins
5. Improve food quality and safety knowledge of catfish producers, processors, retailers, and consumers.

Output Indicators

- Number of experiments conducted, publications, and extension programs serving clientele.
- Percent reduction in bacterial and chemical contaminated product.

Outcome Indicators

- Comparison of bacterial or chemical load on products before and after interventions.
- Number of catfish processing plants with no product contamination problems.
- Number of developed methods adopted by industry.
- Reliance of clientele on food quality and safety experts at MSU.

Key Program Components

- Surveillance programs for human pathogens in catfish products.
- Development of rapid and accurate pathogen and toxin detection methods.
- Development of pre and post-harvest intervention strategies.
- Continue implementation of HACCP programs in catfish production and processing.
- Deliver educational materials to catfish producers, processors, retailers, and consumers.
- Publish research results in peer reviewed scientific journals.

Internal and External Linkages

Multi-Disciplinary

- USDA/ARS and MSU College of Veterinary Medicine

Target Audiences

- Catfish producers, processors, consumers
- Private companies that service the catfish industry
- Local, state, federal, and international regulatory agencies

Program Duration

- Intermediate (human pathogens and harmful residues)
- Long (microbial spoilage; rapid detection methods contaminants; catfish food safety; food quality and safety knowledge)

Education and Outreach Programs

- Deliver educational materials to catfish producers, processors, retailers, and consumers. (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Food Safety

Issue Statement

Foodborne illnesses continue to be a major public health concern. The Council for Agricultural Sciences and Technology in its 1994 report "Pathogens: Risks and Consequences", indicated that each year as many as 9000 deaths and up to 33 million illnesses occur in the United States directly related to food. The economic cost to the United States is devastating with approximately $3 billion related to direct medical expenses and between $6 - $9 billion due to lost productivity.

Americans expect many things from their food supply. They want variety and quality; and they want nutritious, safe foods at a reasonable cost. To many consumers, safe food means that there will be no danger from pathogenic microorganisms, naturally occurring toxins and other potentially harmful chemicals that may be deliberately added to foods. However, scientists generally agree that microorganisms pose a greater threat to human health than other sources of foodborne illnesses.

The objective of food production, processing, and preparation is to provide a safe, wholesome, and nutritious product for consumers. Each party in the delivery of foods has certain obligations to meet and reasonable expectations of the other parties. No single group is responsible for producing safe food. Because of this, voids exist that contribute to a potentially unsafe food supply.

The need for continual education of all food handlers concerning the significant hazards associated with foodborne pathogenic organisms and proper food handling procedures is evident. Control and prevention of foodborne illness outbreaks includes measures to prevent or minimize food contamination, destruction of microorganisms or destruction of toxins and preventing the growth of pathogenic microorganisms. This can be achieved through the application of hazard analysis critical control points (HACCP).

Health and well-being are highly valued in today's society and food is considered to play a major role. Food safety issues are complex and consumers vary greatly in their knowledge of the science of food safety. Mississippi State University through its federal, state and county partnership of professionals has as a goal to conduct research and to deliver food safety and quality educational programs that will to minimize potential food hazards throughout food production, processing, distribution, preparation and utilization.

Priority needs for research and extension efforts in food safety have been identified based on discussions and input from food service industry representatives, processors, consumer groups and health groups. The following needs have been identified:

- Better understanding of foodborne microbial pathogens and toxins in terms of ecology, physiology, and genetics
- Improved methods for detection of foodborne pathogens
- Improved methods for control of foodborne pathogens in production and processing
- Better awareness of hazards associated with foodborne illness by food producers, food processors, food service personnel and consumers
- Better awareness of control measures by food producers, food processors, food service personnel and consumers

- Educating food processors and food service personnel in HACCP techniques and other new food regulations

Resources Allocated

MSU-ES: 8.58 FTE, $517,154 Total

Food Safety

Performance Goals

1. Increase clientele's knowledge of the ecology, physiology and genetics of foodborne pathogens and toxins in order to reduce foodborne illness.
2. Increase clientele's ability to detect and control foodborne pathogens and toxins in production and processing.
3. Increase ability of food producers, food processors and food service personnel's to implement HACCP techniques and other new food regulations.

Output Indicators

- Number of experiments conducted.
- Number of refereed articles published.
- Number of extension programs delivered.
- Number of extension publications published.
- Number of food processors, food service and consumers reached.
- Number of food service personnel certified.
- Number of pathogen and toxin detection methods identified.
    - Number of samples tested.
- Number of advisory committees held.

Outcome Indicators

- Scores on certification tests, pre and posttests, clientele surveys.
- Number of food processing plants and food service establishments with no product contamination problem.
- Number of HACCP systems developed and implemented by clientele.

Key Program Components

- Develop rapid and accurate pathogen and toxin detection methods.
- Deliver food safety and HACCP educational programs and materials to food processors, food service personnel and consumers.
- Develop methods to control food safety hazards.

Internal and External Linkages

Multi-State

- Food Safety for Low Literacy Audiences (Ohio State University Extension Service, Purdue University Extension Service)
- Seafood HACCP Alliance
- Food Animal Protection Research Lab - Texas A&M
- CVM - Texas A&M
- HACCP Round Table - Arkansas
- ERA-IEG-2

Multi-Institutional

- USDA-ARS-Food Safety Cooperative agreement with MSU Food Science & Technology Dept., CVM and USDA Agricultural Research Service
- Mississippi State Department of Health, Alcorn State University, Mississippi Restaurant Association
- Division of Licensure of the Mississippi State Department of Health
- Mississippi Department of Agriculture
- Mississippi Poultry Association
- Mississippi Poultry Companies
- Mississippi State Veterinary Diagnostic Lab

Multi-Disciplinary

- USDA-ARS-Food Safety Cooperative agreement with MSU Food Science & Technology Dept., CVM and USDA Agricultural Research Service.
- HACCP training for meat and poultry processors
- AFDO seafood HACCP alliance training course

Target Audiences

- Food producers
- Food processors
- Food service personnel
- Consumers
- Scientific community
- Local, state, federal, and international regulatory agencies

Program Duration

- Intermediate

Education and Outreach Programs

- Develop rapid and accurate pathogen and toxin detection methods. (Statewide program offered at the county and/or multi-county level)
- Deliver food safety and HACCP educational programs and materials to food processors, food service personnel and consumers. (Statewide program offered at the county and/or multi-county level)
- Develop methods to control food safety hazards. (Statewide program offered at the county and/or multi-county level)

Goal 3: A healthy, well-nourished population

PPA: Human Health

Issue Statement

Human health issues are broad in scope, with many aspects that can be addressed by health education and community policy intervention. The major aspects of poor human health in Mississippi are related to the tremendous incidence of chronic diseases in middle and older age groups, early sexual activity in youth, and high rates of alcohol, tobacco, and drug use in all but the youngest age groups.

Cardiovascular disease, the major American chronic disease, is the cause of premature death for approximately 14,000 Mississippians each year. Cardiovascular disease accounted for 1/4 of all Mississippi deaths between 1990-1995. Chronic diseases also include the approximately 75,000 Mississippians who have been diagnosed with diabetes, and the estimated 75,000 who have diabetes and do not know it. Six percent of the Mississippi population is estimated to have diabetes. Almost 20-25% of Mississippi's African American and Native American population between ages 65-74 actually has diabetes. Over 1,700 Mississippi women are predicted to have breast cancer each year, with approximately 400 resulting deaths each year. Tobacco-related illnesses also have enormous impact, both economically and in potential years of life lost. Lung cancers, with 1800 new cases expected in Mississippi each year, account for approximately 1700 deaths per annum. The costs of chronic disease top 1.5 billion dollars each year in the state.

Mental and physical health habits contribute to chronic diseases, reduced quality of life, prenatal mortality and other health problems in infants, adolescents, and young adults. Twenty-three percent of Mississippi adults smoke tobacco; almost 1/3 of youth in grades 9-12 use tobacco in some form at least once per month. The incidences of sexually transmitted diseases and teen pregnancy rates have ranked in the top three states in the nation for decades. The frequencies of alcohol and substance abuse are often cited as factors in health issues.

Despite these significant problems, almost 2/3 of Mississippians do not use a primary provider unless they have symptoms, and even fewer use scarce mental health promotion resources. Almost half of the state's primary care physicians practice in only six counties; there are often fewer than ten primary care physicians in a county. Six counties have no nurse practitioner; seven counties have fewer than 20 licensed practical nurses; three counties have no dentists; and psychologists practice in only 31 of the state's 82 counties. The bottom line is simple to read: more Mississippians, per capita, develop serious health problems than elsewhere in the nation, and when they do, it is more difficult for them to secure the care they need.

The most effective strategies to deal with the issues of chronic disease and poor health habits include building healthy life skills early, increased utilization of preventive medical care, early detection and treatment of disease, and developing community access to comprehensive health care.

Based on this summary of the health literature, four regional community focus groups, and the guidance of Extension county advisory councils, several critical needs are identified. These needs are

- education to improve the utilization of available medical care
- better life skills and healthy habits in young people
- better care of family care needs and health problems at home
- the development of better health care access

Resources Allocated

MSU-ES: 9.94 FTE, $591,615 Total

Human Health - Family Health Needs

Performance Goals

1. Increase practice of positive health behaviors as a result of Extension programs
2. Increase use of self care and decision-making skills will result in early detection of disease(s) and reduced acute medical care

Output Indicators

- Number of program participants
- Number of programs delivered to targeted audiences
- Number of publications distributed to targeted audiences
- New program(s) in use
- Size and classification of audiences reached

Outcome Indicators

- Comparison of health behaviors pre and post Extension programs
- Comparison of health knowledge/attitudes pre and post Extension programs

Key Program Components

Inservice training of agents in:

- Self Care Plans and Decisions
- Prevention and Early Detection of Disease
- Distribution and development of health materials and programs on:
- Self Care Plans and Decisions
- Prevention and Early Detection of Disease

Internal and External Linkages

Multi-State

- National Network for Health, Health Education Web site www.nnh.gov/healthresources

Multi-Institutional

- Extension Advisory Groups
- Community Health Coalitions
- CDC Breast and Cervical Cancer Coalition

Multi-Disciplinary

- MSU School of Human Sciences

Target Audiences

- Church Outreach Organizations

- Volunteer Groups
- Community Organizations/Clubs
- Unofficial Leaders
- Senior Citizen Groups
- Lay Health Advisors
- Health Provider Associations
- General public

Program Duration

- Intermediate

Education and Outreach Programs

- Self Care Plans and Decisions (Statewide program typically offered at the county and/or multi-county level)
- Prevention and Early Detection of Disease (Statewide program typically offered at the county and/or multi-county level)
- Distribution and development of health materials and programs on:
  - Self Care Plans and Decisions (Statewide program typically offered at the county and/or multi-county level)
  - Prevention and Early Detection of Disease (Statewide program typically offered at the county and/or multi-county level)

Human Health - Improved Access to Health Care Services

Performance Goals

1. Targeted youth will pursue medical careers in rural Mississippi
2. Increased numbers of teens will become aware of health-related career and service opportunities
3. Targeted youth will participate in Extension sponsored health career and service programs
4. Public awareness of defined health policy issues will increase

Output Indicators

- Number of program participants
- Number of publications distributed
- Inservice training for adults/agents
- New program(s) developed
- Size and classification of audiences reached

Outcome Indicators

- Comparison of desire to attend medical school pre and post Rural Medical Scholars program
- Over time, the number of Rural Medical Scholar graduates enrolling in pre-med programs, attending medical school, establishing primary care practices in rural Mississippi
- Number of teens participating in Extension sponsored health career activities
- Comparison of health policy knowledge/attitudes pre and post Extension led informational activities/packages

Key Program Components

- Rural Medical Scholars Program
- Mississippi Health Careers Guide
- Development of teen health career and service program
- Development of information resource material or programs on state health policy issues as needed

Internal and External Linkages

Multi-State

- Southern Extension and Research IEG Committee on Health Systems

Multi-Institutional

- Mississippi's 15 community and junior colleges
- Mississippi Rural Health Corps Advisory Task Force
- Mississippi Rural Health Association
- Mississippi Department of Health, Office of Rural Health
- Community Health Coalitions
- Northeast Mississippi Medical Center, Family Medicine Residency Program

Multi-Disciplinary

- MSU Division of Continuing Education
- MSU College of Arts and Sciences

Target Audiences

- Community coalitions
- Health provider associations
- Mississippi teens
- Health care providers
- Public officials
- General public

Program Duration

- Intermediate (health policy issues; health career and service)
- Long (youth will pursue medical careers in rural Mississippi)

Education and Outreach Programs

- Rural Medical Scholars Program (Statewide program)
- Mississippi Health Careers Guide (Statewide program)

Human Health - Life Skills and Healthy Habits in Young People

Performance Goals

1. Targeted teens will participate in Extension sponsored teen health volunteer (peer health advisor) programs
2. Targeted audiences will adopt positive health behaviors as a result of Extension programs in Prevention and Early Detection of Disease, Alcohol/Tobacco/Substance Abuse Prevention, Abstinence from Sexual Involvement, and Life Skills

Output Indicators

- Number of program participants
- Number of programs delivered to targeted audiences
- Number of publications distributed to targeted audiences
- New program(s) in use
- Size and classification of audiences reached

Outcome Indicators

- Comparison of health behaviors pre and post Extension programs
- Comparison of health knowledge/attitudes pre and post Extension programs

Key Program Components

Development of teen health volunteer programs in

- Alcohol/Tobacco/Substance Abuse Prevention
- Abstinence from Sexual Involvement
- Life Skills
- Inservice training of agents in:
- Alcohol/Tobacco/Substance Abuse Prevention
- Abstinence from Sexual Involvement
- Life Skills
- Distribution and development of health materials and programs on:
- Alcohol/Tobacco/Substance Abuse Prevention
- Abstinence from Sexual Involvement
- Life Skills

Internal and External Linkages

Multi-State

- National Network for Health, Health Education Web site www.nnh.gov/healthresources

Multi-Institutional

- Partnership for Healthy Mississippi, Attorney General's Office
- Extension Advisory Groups
- Mississippi Department of Health
- Community Health Coalitions
- Mississippi Governor's Task Force on Out-of-Wedlock Pregnancy

Multi-Disciplinary

- MSU School of Human Sciences

Target Audiences

- Church Outreach Organizations
- Volunteer Groups
- Community Organizations/Clubs
- Unofficial Leaders
- Children's Advocacy Groups
- Parent -Teacher Organizations
- Lay Health Volunteers
- Health Providers

- Mississippi teens
- 4-H Members
- General public

Program Duration

- Intermediate

Education and Outreach Programs

- Teen Health Volunteer Program (Statewide program typically offered at the county level)

Human Health - Utilization of Available Medical Care

Performance Goal

1. Increased numbers of teens and adults will use health services appropriately as a result of Extension programs

Output Indicators

- Number of program participants
- Number of programs delivered to targeted audiences
- Number of publications distributed to targeted audiences
- New program(s) in use
- Size and classification of audiences reached

Outcome Indicators

- Comparison of health service utilization pre and post Extension programs

Key Program Components

- Inservice training of agents in:
  - Caregiver Support
  - Organizing Health Care

- Distribution and development of health materials and programs on:
  - Caregiver Support
  - Organizing Health Care

Internal and External Linkages

Multi-State

- Southern Extension and Research IEG Committee on Health Systems
- National Network for Health, Health Education Web site www.nnh.gov/healthresources

Multi-Institutional

- Extension Advisory Groups
- Mississippi Department of Health
- Community Health Coalitions

Multi-Disciplinary

- MSU School of Human Sciences

Target Audiences

- Caregivers
- Church Outreach Organizations
- Volunteer Groups
- Community Organizations/Clubs
- Unofficial Leaders
- Senior Citizen Groups
- Children's Advocacy Groups
- Parent -Teacher Organizations
- Community Action Coalitions
- Lay Health Advisors
- Health Provider Associations
- 4- H Members
- Health care providers
- Public officials
- General public

Program Duration

- Intermediate

Education and Outreach Programs

- Caregiver Support (Statewide program typically offered at the county and/or multi- county level)
- Organizing Health Care (Statewide program typically offered at the county and/or multi-county level)

PPA: Human Nutrition

Issue Statement

Good food is one of the pleasurable things in life. Yet poor food choices, made consistently over time, can lead to illness, disability, and even death. Nutrition has a major impact on four of the leading chronic diseases in Mississippi: coronary heart disease, stroke, cancer, and diabetes. Chronic diseases are costly in terms of lives and dollars. They account for more than 70% of all deaths in Mississippi and more than 60% of all medical expenditures.

In 1997, Mississippi ranked first among states in the number of deaths (42%) due to cardiovascular diseases (CVD), which includes coronary heart disease and stroke. Twenty one percent of the state's deaths are attributed to cancer; two percent result from diabetes.

Overweight and hypertension (high blood pressure) contribute to chronic diseases and are prevalent in Mississippi. In 1996, Mississippi ranked second nationwide in the number of overweight adults. It is estimated that 41% of African Americans and 30% of whites in Mississippi suffer from hypertension.

The low per capita income also influences Mississippi's health status. Poor people are less likely to have regular contact with a doctor and are less likely to take preventive measures that could protect their health. Barriers such as lack of transportation also greatly influence the health status of the poor.

Today's killer diseases are, in large part, preventable. They are mainly the result of choices individuals make every day. Among the most important behaviors related to poor health are the use of tobacco, lack of physical activity, and poor nutrition.

Surveys show that while some advances have been made toward meeting the Dietary Guidelines, there is still much room for improvement. Healthy People, the U.S. prevention agenda, is a national tool that identifies the most significant preventable threats to health. Progress reports of Healthy People 2000 indicate that the average intake of fruits and vegetables has increased in the U.S. since 1990. Yet only 36% of the population get the recommended number of servings needed daily. A 1998 survey indicates that only half of that number (18%) of adult Mississippians get the recommended number of fruits and vegetables needed. This places Mississippi 9th highest among states where adults do not get adequate fruit and vegetable in their diets. National surveys of high school students indicated that 72% got fewer servings of fruits and vegetables than needed. In Mississippi that percentage jumped to 83%. Thus, fewer Mississippi high school students get the recommended servings of fruits and vegetables than in any other state, except one.

Healthy People 2000 progress reports also revealed that the average fat and saturated fat intake have decreased but only about one third of the population nationwide meets the goals of dietary fat that is less than 30% of total calories. A particularly disturbing finding is that overweight prevalence has increased substantially since the 1976-80 baseline and the number of self-reported overweight adults who said they increased exercise and reduced calories decreased from 1985 to 1995.

Based on Healthy People goals, a series of statewide focus groups held in 1998 among low-income consumers, discussions with other consumer groups and information from health agencies, the following consumer needs have been identified.

- Improved food choices
- Improved methods for reaching at-risk, hard-to-reach populations
- Better awareness of the benefits of healthy eating
- Improved balance of food intake and physical activity
- Nutritional assessment of high-risk population groups to determine if nutritional needs are being met

Resources Allocated

MSU-ES: 11.20 FTE, $717,462 Total

Human Nutrition – Health and Nutrition

Performance Goals

1. To optimize health by educating consumers to select (and provide for family members) an increased variety of foods based on the Food Guide Pyramid
2. To reduce nutrition-related health risk factors by educating consumers to select (and provide family members with) foods based on the Dietary Guidelines to prevent/delay diet-related chronic diseases
3. To educate consumers to become better managers of food purchasing resources

Output Indicators

- Number of human nutrition research projects conducted
- Number of refereed articles from research projects
- Number of Extension nutrition education programs delivered to consumers
- Number of consumers participating in Extension nutrition education programs
- Number of nutrition education-related inservice trainings offered for Extension agents
- Number of Extension publications developed

Outcome Indicators

- Number of clients who increase the number of fruits and vegetables in their diets
- Number of clients who reduce health risk factors by adopting one or more of the following nutrition-related practices recommended in the Dietary Guidelines for Americans (decrease fat, salt, sugar in the diet)
- Number of clients who decrease the number of times they run out of food before the end of the month and/or decrease the number of times they must utilize emergency food programs.
- (All 3 indicators will be measured by using pre- and post-test surveys for comparison.)

Key Program Components

- Provide nutrition education focusing on healthful food choices, food resource management, and food preparation. (Includes EFNEP, the Family Nutrition Program, and base nutrition programs.)

Internal and External Linkages

Multi-State

- Food and Nutrition Service (Southeast Region)

Multi-Institutional

- Mississippi Department of Agriculture
- Mississippi Department of Education
- Mississippi Department of Human Services
- Mississippi Department of Health
- Mississippi Food Network
- Mississippi Beef Council
- Head Start
- American Heart Association in Mississippi
- Southeast United Dairy Industry Association

Target Audiences

- Base Nutrition Programs: Consumers, African Americans, Hispanic Americans, Vietnamese, volunteers, parents and caregivers, child care providers, Mississippi Homemaker Volunteer members, youth at risk,4-H Youth
- EFNEP: limited resource homemakers with young children
- The Family Nutrition Program (FNP): food stamp recipients and those eligible to receive food stamps

Program Duration

- Long

Education and Outreach Programs

- EFNEP (Statewide program typically offered at the county and/or multi-county level)
- Family Nutrition Program (Statewide program typically offered at the county and/or multi-county level)
- Base Nutrition Programs (Statewide program typically offered at the county and/or multi-county level)

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

PPA: Cotton

Issue Statement

Cotton has long been Mississippi's leading agronomic crop in economic value. Historically, Mississippi has been one of the top three cotton producing states in the U.S. Until recently, Mississippi ranked second in acreage behind Texas; third in yield per acre behind California and Arizona; and third in total bales produced behind Texas and California.
Eradication of the boll weevil in the Southeastern U.S. and the Freedom to Farm provisions of the 1995 Farm Bill has resulted in Georgia and other Southeastern states increasing their acreage, while Mississippi acreage has declined.

In 1995, 1.46 million acres of cotton were harvested with an economic value of $733,749,000 before an economic impact multiplier is applied. In 1996, harvested acreage declined to 1.12 million acres with a production value of $648,621,000. In 1997, Mississippi harvested 970,000 acres, the first time since 1983 cotton producers harvested less than 1.0 million acres, and only the fifth time since 1866. Even though the 1997 crop set a new yield per acre record, 901 pounds of lint per acre, total production value was only $612,326,000. In 1998, harvested acreage decreased to 940,000 and the production value dropped to $567,000,000. The reasons for these reductions are: increased production costs, increased difficulties in managing selected insect pests, depressed cotton prices and Freedom to Farm provisions of the 1995 Farm Bill which allowed growers to rotate to more easily grown commodities such as corn. In order for Mississippi cotton producers to remain competitively globally and with the rest of the cotton belt and meet environmental standards, they must adopt new techniques to improve efficiency and to reduce costs, while maintaining or improving yields. Some of these techniques include eradication of the boll weevil, use of transgenic varieties, development of pest management strategies for transgenic cotton and post boll weevil eradication efforts, conservation tillage, use of GPS/Remote sensing technology in precision farming, and adopt soil-water-pesticide-nutrient management strategies that will protect the crop and promote environmental stewardship.

The following objectives are proposed to address these issues:

- Conduct research to identify profitable and sustainable practices.
- Seek input from growers, Farm Bureau, Delta Council and National Cotton Council as to real local, regional and national issues.
- Conduct in field demonstrations to deliver new technology.
- Identify priority areas in cotton production for research and enhancement.
- Identify marketing opportunities and teach marketing/budget management.

Resources Allocated

MSU-ES: 12.56 FTE, $950,000 Total
MAFES: 26.98 FTE, $7,542,348 Total

Cotton - Insect Management–IPM

Performance Goals

1. Maintain or improve the ability of producers to manage cotton insects in a cost-effective manner.
2. Develop insect management programs for post-boll weevil eradication systems that increase use of non-insecticidal IPM tools.
3. Develop effective insect management programs that minimize effects on non-target organisms and the environment.

Output Indicators

- Number of extension programs delivered
- Number of clientele participating in extension programs
- Experiments/trials conducted on cotton IPM
- Publications

Outcome Indicators

- Per acre insect control costs
- Proportion of acreage utilizing regular scouting
- Proportion of acreage utilizing economic thresholds as the basis for treatment decisions
- Proportion of acreage utilizing insect resistant varieties to reduce insecticide use
- Proportion of acreage utilizing selective insecticides to preserve beneficial insects
- Acreage
- Yield

Key Program Components

- Cotton IPM Education Program
- Cotton Insect Management Research/Demonstrations
- Boll Weevil Eradication Program
- Cotton Insecticide Efficacy Evaluation
- Resistance Management/Resistance Monitoring
- Cotton Insect Population Monitoring

Internal and External Linkages

Multi-State

- Southeastern Boll Weevil Eradication Technical Advisory Committee

Multi-Institutional

- Insecticide Evaluations (10+ Agrochemical Companies)
- Southeastern Boll Weevil Eradication Technical Advisory Committee

Target Audiences

- Cotton Producers
- Cotton Production Professionals (Consultants, Agribusiness Field Reps)
- General Public

Program Duration

- Intermediate

Education and Outreach Programs

- Cotton IPM Education Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Boll Weevil Eradication Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Soybeans

Issue Statement

Soybeans occupy the largest row crop acreage in Mississippi (slightly over 2.0 million acres). Interest in improving soybean production is on the rise as growers are interested in advising higher yields and providing better management to their crop. With the introduction of freedom to farm, producers are using the practice of crop rotation. Improved crop production practices center around the use of new varieties, earlier planting dates, pest management systems, various tillage systems, improved irrigation scheduling, and better crop management.

The following objectives are proposed as avenues to address these issues.

– Conduct research to identify profitable practices.
– Conduct field demonstrations to confirm and promote research-based recommendations that increase profits.
– Identify areas of soybean production that need further evaluation.

Resources Allocated

MSU-ES: 8.11 FTE, $565,385 Total
MAFES: 4.10 FTE, $3,201,594 Total

Soybeans - Integrated Pest Management

Performance Goals

1. Increase IPM practices (scouting for pests, utilizing control measures such as resistance varieties, crop rotation, and the judicious use of pesticides)
2. Increase producers' understanding of pest management options through grower meetings and publications.
3. Improve pest control by integrating transgenic and mutant varieties into soybean production systems.

Output Indicators

- Number of programs delivered to producers
- Number of producers participating in programs
- Publications
- Number of experiments conducted in pesticide control systems

Outcome Indicators

- Yields
- Nematode Populations
- Percentage of acreage treated for pests
- Characteristics of varieties planted

Key Program Components

- Transgenic and mutant varieties identification
- Pest Control Recommendations

- On-farm demonstrations
- SMART Program
- Pesticide Evaluations

Internal and External Linkages

Multi-State

- Research Trials
- Southern Soybean Conference
- Tri-State Soybean Forum
- Transgenic Soybean Eradication

Multi-Institutional

- Company Soybean Varietal Evaluations
- Company Insecticide/Fungicide Evaluations

Target Audiences

- Soybean Producers
  - Private Industry
- Consultants
- County Agents
- Soybean Commodity Groups
- General Public

Program Duration

- Intermediate

Education and Outreach Programs

- Pest Control Recommendations (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- On-farm demonstrations (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- SMART Extension Soybean Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)
- Pesticide Evaluations (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Swine

Issue Statement

In 1998, MS produced 433,370 pigs with a gross market value of $35.8 million (National Pork Board Check-off Report). Mississippi's inventory of hogs and pigs was estimated at 275,000 head on December 1, 1998. This reflects a 25 percent increase over 1997 and 28 percent over 1996. The number kept for breeding is estimated at 30,000 which is a 7 and 15 percent increase over 1997 and 1996, respectively. Pigs per litter in 1998, averaged 8.86 compared with 8.51 during 1997. There were 2000 farms with hogs in 1998 (Mississippi Agricultural Statistics). Total economic impact of all segments and related agribusiness of the swine industry for 1998 is estimated at $118 million

Independent pork production in Mississippi primarily consists of farrow to finish swine operations. Many of these producers feel pressured to increase size of operation to maintain market access and adopt new technologies to remain economic competitive. The majority of pigs produced in Mississippi are produced by company/contract production. This has been a growing segment of the swine industry but record low market prices and public concerns of environmental issues have discouraged additional growth.

Priority issues have been identified by input from the MS Pork Producers Association, County Agents and other producer advisory groups. Major areas identified include Environment/Odor; Marketing; Animal Health; Nutrition; Breeding and Genetics.

Environment/Odor is a national issue for pork producers. In Mississippi swine industry growth has been stopped due to Legislative and Regulatory actions. Public concern regarding swine waste/odor became an issue as a result of increased size, location and number of swine operations being constructed. Existing pork operations are faced with incorporating emerging waste/odor technologies at the producer's expense and a time of record low market prices. New cost effective technologies must be developed and transferred to the producer to sustain pork production.

Marketing of swine has changed dramatically over the past few years. Mississippi producers are fortunate to have a major packer/processor in state although alternative markets should be explored and developed. Producers need to keep and utilize production and financial records in order to compete in the global market.

Animal Health is a concern of pork producers. From a production standpoint, animal diseases decrease economic return and pose problems of carcass disposal. Other emerging issues involve food safety and the limitation of antibiotic use in swine production. Producers should be encouraged to participate in the national pork quality assurance program that addresses the on-farm HAACP concept of food safety and drug use. Preventative disease management along with production technologies such as segregated early wean pigs can assist producers with animal health issues.

Nutrition accounts for 60% of the cash cost of pork production. Nutritional programs that meet all nutritional requirements of genetically superior animals and incorporate concepts of reducing

environmental and food safety concerns must be provided to the producers in order to sustain economical production of pork.

Breeding and genetics play a vital role in pork production. Genetics establishes the limit and potential return on investment to the producer. Many issues are involved with breeding programs of a swine operation such as genetic selection, EPD's, artificial insemination, crossbreeding, reproductive performance and management.

Resources Allocated

MSU-ES: 2.44 FTE, $244,000 Total
MAFES: 1.76 FTE, $802,731 Total

Swine - Waste/Odor Management

Performance Goals

1. Develop cost effective technologies to reduce odor and sustain water quality.
2. Inform producers about environmental regulations and teach them how to comply with the regulations.
3. Increase producer participation in the environmental assurance and on-farm odor assistance programs.

Output Indicators

- Number of experiments conducted in environmental technologies
- Number of extension environmental program delivered to producers
- Number of producers participating in programs
- Publications and resource materials developed

Outcome Indicators

- EAP certified producers
- Changes in methods of waste management
- Farms completing on-farm odor assessment

Key Program Components

- Research technologies to improve nutrient efficiency, reduce odor, improve water quality and manage waste handling and application.
- Provide educational programs and resource materials to transfer technology to producers.
- Provide continuing education through certification in the environmental assurance and on-farm odor assistance programs.

Internal and External Linkages

Multi-State

- National Pork Producers Council
- Environmental Protection Agency
- USDA
- American Society of Animal Science
- American Society of Agronomy
- Regional S-145 Committee

Multi-Institutional

- Alcorn State University
- Natural Resources Conservation Service
- Department of Environmental Quality
- MS Department of Agriculture
- MS Pork Producers Association

Multi-Disciplinary
- Agricultural and Biological Engineering
- Animal Dairy Sciences
- Plant and Soil Sciences
- College of Veterinary Medicine

Target Audiences
- Producers
- Industry
- State Agencies

Program Duration
- Intermediate(environmental regulations; environmental assurance and on-farm odor assistance programs)
- Long (technologies to reduce odor and sustain water quality)

Education and Outreach Programs
- Swine Producers Extension Program (Statewide program typically offered at the county and/or multi-county level, offered in conjunction with commodity groups)

PPA: Wildlife & Fisheries

Issue Statement

Mississippi is rich in wildlife and fisheries resources that are important to its heritage, culture and economic well-being. In 1996, state residents and non-residents aged 16 years and older spent $1.8 billion in consumptive and non-consumptive wildlife-related recreation. In the same year, 680,000 Mississippians (16 years or older) fished, hunted or watched wildlife. Most of Mississippi is either privately owned or industrial forest or agricultural land with a high potential for fish and wildlife production and management. Many landowners do not know how to manage their land properly for different species of these resources, and need current research-based information. Much of the state's 18.2 million acres of commercial and private forestland, 225,000 acres of small impoundments, 14,205 miles of streams and rivers, and 13 million acres of agricultural open lands is not managed for wildlife/fisheries. Additionally, opportunities for quality recreational experiences and/or additional revenue generation through development of wildlife/fisheries related enterprises exist on Mississippi land bases for property owners and resource stakeholders.

Sociological and demographic changes associated with increased urbanization and changing lifestyles, coupled with greater public demand for enjoyment of wildlife and fisheries resources, have led to new dilemmas in conservation issues, as well as user conflicts. These dilemmas are frequently compounded by increased public awareness and involvement in issues such as endangered/threatened species conservation, traditional hunting/fishing activities, environmental stewardship and quality of life, wildlife/fisheries population management, ecosystem restoration and habitat management, and agricultural and agroforestry intensification.

To address current and future challenges in wildlife and fisheries management, Mississippians need accurate and reliable information. This need can be met through well-designed and executed research, combined with pro-active, client-driven extension programming. Advisory and client input groups have helped identify the following priority/need areas:

- Development and refinement of management strategies for sustainable wildlife and fisheries resources
- Integration of fish and wildlife conservation with other land uses
- Impacts of intensive agricultural and agroforestry on wildlife/fisheries habitats and populations
- Economic impacts and business opportunities of wildlife/fisheries related activities
- Youth life-skills development through conservation and hunting/fishing education
- Adult education concerning fish and wildlife management on private lands
- Wildlife/human interaction and conflicts
- Continuing professional education

Resources Allocated

MSU-ES: 8.26 FTE, $622,923 Total
FWRC: 4.90 FTE, $1,217,065 Total

Wildlife & Fisheries - Ecology and Management of Sustainable Resources

Performance Goals

1. Determine population ecology, habitat requirements, and population responses to various habitat types, management practices, land uses, and harvest strategies
2. Identification and development of sustainable fish and wildlife management techniques and programs
3. Gain information on sustainable management of game and furbearers for private and public lands
4. Determine approaches that integrate sustainable fish and wildlife use with other land uses
5. Determine ecological interactions between fish and wildlife species assemblages

Output Indicators

- Number of research projects funded and experiments conducted
- Number of publications for general public or agency use
- Number of refereed articles or manuscripts from research projects

Outcome Indicators

- Research results in improved approaches to population and habitat management.
- Acceptance by funding entities of research findings and recommendation in final reports
- Research findings utilized by private landowners and fish and wildlife users.
- Management practices successfully developed and/or implemented.

Key Program Components

- Population ecology and habitat use/requirements of the Eastern Wild Turkey, including population responses to ecosystem restoration, silvicultural management, and predation
- Population and habitat use/requirements of small game species, Northern Bobwhite Quail and
- Eastern Cottontail Rabbit, including population responses to various habitat management techniques, agricultural land use, and predation
- Population ecology of habitat use/requirements of and predator and pathogen effects on resident and migratory waterfowl.
- Population ecology, social and population characteristics, and census techniques for white-tailed deer
- Assessment and management of game fish stocks in riverine and reservoir systems, including the determination of influential abiotic and biotic factors
- Population ecology, prey selection, and habitat use of mid-size furbearers - raccoons, bobcats, skunks, foxes, and opossums
- Beaver impoundment acreage and damage assessment in Mississippi

Internal and External Linkages

Multi-State

- Organizations:
    - Ducks Unlimited
    - Quail Unlimited
    - National Wild Turkey Federation
    - Tall Timbers Research Station
    - Wildlife Management Institute
    - Watershed Science Institute
    - Welder Wildlife Foundation

- State Agencies
  - Minnesota Department of Natural Resources
  - Wisconsin Department of Natural Resources
  - Missouri Department of Conservation

Multi-Institutional
- Mississippi Department of Wildlife, Fisheries, and Parks (Game and Fish Division)

Target Audiences
- Private landowners
- Public natural resource managers, administrators, and planners
- Public natural resource policy professionals
- Corporate land managers and owners
- Fish and wildlife consumptive users and recreationists
- Agricultural producers
- Forest managers

Program Duration
- Long

Education and Outreach Programs
- None

Wildlife & Fisheries - Ecosystem Management and Restoration

Performance Goals
1. Determine biological diversity of native fauna and flora on public and private lands.
2. Determine responses of sensitive and/or protected fish and wildlife species to various land use, land management regimes, and cervid herbivory.
3. Determine approaches to ecological restoration of aquatic and terrestrial ecosystems.
4. Collect data on population ecology, habitat requirements and assessments, and cumulative impact effects on rare native species assemblages and federally protected species.
5. Increase information on integration of conservation of native biological diversity and multiple land uses.

Output Indicators
- Number of research projects funded and experiments conducted
- Number of publications for general public or agency use
- Number of refereed articles or manuscripts from research projects

Outcome Indicators
- Research results in improved approaches to conservation of native biological diversity, ecosystem management, and ecosystem restoration.
- Increased database on occurrence and habitat use of native flora and fauna in terrestrial and aquatic ecosystems.
- Development of approaches that integrate ecosystem management, biodiversity conservation, and multiple land uses on public and private lands.

- Acceptance by funding entities of research findings and recommendation in final reports
- Research findings utilized by private land owners and fish and wildlife users

Key Program Components

- Population ecology and status, habitat requirements/use, and population recovery potential for federally protected species, such as Louisiana Black Bear and Red-cockaded Woodpecker
- Impacts of large herbivores on community structure and biodiversity in Mississippi
- Ecosystem restoration and conservation of native biological diversity on Department of Defense lands
- Cumulative impacts of silvicultural management on avifauna and herpetofauna on U.S. Forest Service lands
- Response of plant and animal communities to forest management techniques on commercial timber lands
- Ecology and diversity of fishes in streams of public lands and in various aquatic ecosystems
- Ecological restoration of aquatic ecosystems
- Ecology, restoration, and management of bottomland hardwood forests
- Biological diversity of ephemeral and permanent wetlands

Internal and External Linkages

Multi-State

- Black Bear Conservation Committee
- Hobart Aimes Foundation
- Tall Timbers Research Station
- Wildlife Management Institute
- Watershed Science Institute
- Aquatic Ecological Restoration Foundation
- The Nature Conservancy
- Welder Wildlife Foundation
- Minnesota Department of Natural Resources
- Wisconsin Department of Natural Resources

Multi-Institutional

- Mississippi Department of Wildlife, Fisheries, and Parks (Natural Heritage Program
- USDA Forest Service
- USDA Natural Resource Conservation Service
- U.S. Army Corps of Engineers
- U.S.D.I. Fish and Wildlife Service (Ecological Services, Endangered Species Office, and
- National Wildlife Refuge Systems)
- USDI National Park Service
- USGS NBS, Mississippi Cooperative Research Unit
- DOD Army National Guard (Mississippi Military Department), U.S. Army (Alabama and North Carolina), U.S. Navy (Mississippi)
- NCASI
- Weyerhauser
- American Cyanamid

Target Audiences

- Private landowners
- Public natural resource managers, administrators, and planners

- Public natural resource policy professionals
- Corporate land managers and owners
- Fish and wildlife non-consumptive users and recreationists
- Forest managers
- Conservation organizations

Program Duration

- Long

Education and Outreach Programs

- None

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

PPA: Agribusiness

Issue Statement

Agribusiness typically includes all of the economic activities associated with food and fiber products from the farm to the consumer. In Mississippi that means more than 351,000 jobs or over 28 percent of the state's total employment. Individual annual earnings for these employees in 1992 accounted for 23% or nearly $5.5 billion in wages and salaries in the state. The agribusiness sector contributes over 25% or nearly $11 billion of the state's economic value-added activity. Just over 17% of this contribution is attributed to value-added in the agricultural production sector. The remaining 83% is related to activities such as processing, transportation, retailing, etc. that occur beyond the farm gate. Within the agribusiness sector in Mississippi the two largest components in rank order are 1) wood and wood products and 2) poultry and eggs and other meats. Wood and wood products is the largest component accounting for 128,415 jobs and $4.6 billion in net value added. This position is attributed to a rapidly growing furniture manufacturing and wood products industry. The poultry and eggs and other meats component in 1992 employed 64,269 workers and contributed almost $2 billion in net value added.

Following national trends, the largest increases in employment and economic effects within the agribusiness sector will likely come from increasing value-added to raw agricultural products, both those produced in the state and those imported from other states. In the U.S., purchases of food consumed away from home have risen to 46 percent of total food expenditures. More of the consumer's food dollar will continue to go to processing and marketing (now 77%) and less will be captured by the production sector (now 23%).

Priority needs for research and extension efforts in agribusiness have been identified through interaction with extension specialists and research scientists and from information gathered from industry representatives and agricultural-related organizations. Priority needs are outlined as follows:

- Operational efficiencies and management controls
- Quality assurance and food safety programs
- Impact assessment and strategic planning for agribusiness development
- Educational programs directed toward an increased awareness and understanding of contractual arrangements, negotiating techniques, an other market opportunities as alternatives to traditional bulk commodity movement of agricultural products
- Market development
- The application of technologies, including biotechnologies, within each of the above priorities

Resources Allocated

MSU-ES: 4.03 FTE, $305,154 Total
MAFES: 4.93 FTE, $1,227,125 Total

Agribusiness—Agribusiness Development

Performance Goals

1. Agribusiness firm managers will understand the importance of accurately interpreting productivity/yield data and implementation of business and management control systems
2. Adoption of newer technologies, e.g., precision farming through remote sensing applications, will be enhanced.
3. Future agribusiness leaders will be trained in current management thought, including the role of biotechnology in crop and livestock productivity advances and environmentally sensitive resource allocations.

Output Indicators

- Number of participants in technical assistance and education programs
- Number of presentations, workshops, seminars, short courses, etc.
- Number of graduate degrees conferred

Outcome Indicators

- Operation/firm productivity efficiencies before/after
- Participant satisfaction with information/training received
- Research, industry and consumer reports on operational improvements
- Public awareness/acceptability of biotechnological products

Key Program Components

- Masters of Agribusiness Management (MABM) graduate teaching
- Dissemination and interpretation of Geographical Information System and Global Positioning System information technologies
- Benefit/cost analyses of biotechnology adoption
- Technical assistance, e.g., in-plant productivity and management issues
- Economic analyses, feasibility studies of business startups and expansions

Internal and External Linkages

Multi-Institutional

- Mississippi Department of Economic and Community Development
- Mississippi Department of Agriculture and Commerce
- U.S. Department of Agriculture
- U.S. Department of Commerce

Multi-Disciplinary

- Agribusiness Institute
- College of Agriculture and Life Sciences
- College of Business and industry
- College of Engineering
- Forest and Wildlife Research Center
- MSU Extension Service
- Mississippi Agricultural and Forestry Experiment Station

Target Audiences

- Commercial farm owners/operators
- Agribusiness firm managers

- Industrial recruiters and economic developers
- Regulatory and policy making agencies
- Undergraduate students with technical and agricultural-related interests

Program Duration

- Long

Education and Outreach Programs

- Dissemination and interpretation of Geographical Information System and Global Positioning System information technologies (Statewide program)
- Benefit/cost analyses of biotechnology adoption (Statewide program)
- Economic analyses, feasibility studies of business startups and expansions (Statewide program)

PPA: Child/Youth/Families at Risk (CYFAR)

Issue Statement

Children, youth, and families at risk comprise an important clientele group of MSU-ES. This group has glaring needs that must be met in order to improve the quality of life for Mississippians.

According to the 1996 Kids Count Mississippi Data Book:

- More than one in six Mississippi children live in severely distressed neighborhoods.
- Thirty-two (of 82 total) counties have severely distressed neighborhoods.
- Four counties are considered severely distressed neighborhoods in their entirety.
- From 1984 to 1994 births to single teens increased 25%.
- Mississippi continues to lead the nation in the percentage of births to teens. More than 22% of all babies born in 1994 were born to teenagers. More than 32% of those mothers were giving birth to their second, third, fourth or fifth child. In addition, 80% of the teen mothers were unmarried.
- A greater percentage of children aged 1 to 12 per 100,000 die in Mississippi than in any other state, except for Louisiana and Alaska.
- Mississippi ranks 49th among the states in teen violent death rate for teens ages 15 to 19. Teen accidents have increased 14 percent since 1989, but teen homicides have jumped 128 percent in the past six years. Teen suicides have increased 57 percent.
- Three out of four high school seniors graduated from Mississippi's public schools in 1995. School dropouts continue to be a major issue.
- Teens have the highest unemployment rates of any age by group. Mississippi ranks 37th in the percentage of teens not attending school and not working.
- Mississippi ranks 49th overall in the care of its children.

Recent years' Extension agent in-service agendas have included topics central to children, youth and families at risk issues. Monthly newsletters have highlighted issues and ways of dealing with them. Great strides have been made in networking and forming coalitions. Extension professionals from the four program areas have worked together on multiple projects. Downsizing of staff resulting in multiple county assignments has magnified the need to work together with others (Extension and non-Extension) who have similar goals.

The Mississippi State University - Extension Service (MSU-ES) participated in the national CYFAR survey of readiness in the area of Children, Youth and Families at Risk. One assumption of the CYFAR survey and report is that Extension will better support community-based programs for children, youth and families at risk when personnel have a vision and plan for programming; staff and volunteers are trained, supported and rewarded appropriately; Extension professionals are viewed as critical resources in research and education; diversity, inclusively, and pluralism are valued; staff collaborate with their colleagues in Extension and the University; and also collaborate with others in the community, county, state and nation.

A recent CYFAR State Strengthening proposal submitted by MSU-ES had two primary objectives: 1) to improve statewide capacity to support community-based programs for children, youth, and families at risk, and 2) to improve the quality and quantity of comprehensive community-based programs for children, youth, and families at risk

Mississippi's highest priority need to program effectively for children, youth and families at risk is to have:

- Children whose health, safety, nutrition and recreational needs are met;
- Youth who's social, education, health and recreational needs are met;
- Parents who know how and where to access services for themselves and their families;
- A safe, caring community that nurtures its families, children, and youth by centralizing needed services.

Resources Allocated

MSU-ES: 17.25 FTE, $1,128,538 Total

CYFAR - Reducing At-Risk Behaviors

Performance Goals

1. Youth participants will increase their self-esteem and ability to learn life skills.
2. Adult and youth participants will improve their quality of life through application of subject matter skills gained.
3. Parents will gain parenting skills that will improve the quality of life for families.
4. Youth will apply the basic pillars of character and the skills of dealing with conflict.
5. Youth participants will improve workforce skills.

Output Indicators

- Number of programs conducted
- Youth involved in 4-H programs in-school, short-term, camping and/or club
- Youth enrolled in personnel development 4-H projects and projects that focus on life skill development
- Publications and teaching materials developed and distributed

Outcome Indicators

- Number of youth applying conflict management skills and applying the pillars of character
- Number of youth enrolled and involved in workforce prep programs that focus on life skill development
- Number of at-risk youth gaining one of the critical life skills
- Number of parents applying positive parenting skills
- Behavioral change in youth involved in programming (i.e. Increased self esteem, leadership skills gained and community service projects completed)

Key Program Components

- Character Counts training for youth in-school programs and in club programs
- Talking with T.J. Levels I and II will be used to improve team work and conflict management skills.
- Leadership 2000, levels I-III will provide leadership life skill training to youth
- Parenting education
- Day care provider training
- Personnel development and Life skill projects

Internal and External Linkages

Multi-State

Collaborators and networks with CYFAR initiative

Multi-Institutional

- Local school systems
- County and state advisory councils
- PTA groups and PTO organizations
- Other youth serving agencies

Target Audiences

- Youth ages 5-18 that are defined as at-risk
- Children 0-5 that are at risk
- Parents
- Communities with high risk factors

Program Duration

- Intermediate

Education and Outreach Programs

- Character Counts training for youth in-school programs and in club programs (Statewide program typically offered at the county and/or multi-county level)
- Talking with T.J. Levels I and II will be used to improve team work and conflict management skills. (Statewide program typically offered at the county and/or multi-county level)
- Leadership 2000, levels I-III will provide leadership life skill training to youth (Statewide program typically offered at the county and/or multi-county level)
- Parenting education (Statewide program typically offered at the county and/or multi-county level)
- Day care provider training (Statewide program typically offered at the county and/or multi-county level)

CYFAR - Nurturing Families

Performance Goals

1. Increase the number of parents involved in programs that will enable them to better communicate and understand their children
2. Implement programs that assist agents and master volunteers in understand and implement strategies for becoming better parents

Output Indicators

- Number of seminars, workshops, and short courses conducted
- Media releases:
  - Newsletters, TV/Radio, News articles, and Web site hits

Outcome Indicators

- Services Used
- Knowledge Gained

- Skills Acquired

Key Program Components

- ABC's of Young Children
- Building Strong Families
- Birth - Development
- Care/Facilities Selection
- Literacy Programs
- Parenting Education

Internal and External Linkages

Multi-State

- Collaborators and networks with CYFAR initiative

Multi-Institutional

- MS Early Childhood Association
- MS State Department of Health
- MS Department of Education
- Civic Clubs
- Public Schools and affiliated organizations
- American Red Cross
- Americorp and Vista Volunteers
- Governor's Office on Literacy

Target Audiences

- Families that are defined as at-risk
- Children 0-5 that are at risk
- Parents
- Communities with high risk factors
- Grandparents
- Child caregivers

Program Duration

- Intermediate

Education and Outreach Programs

- ABC's of Young Children (Statewide program typically offered at the county and/or multi-county level)
- Building Strong Families (Statewide program typically offered at the county and/or multi-county level)
- Birth - Development (Statewide program typically offered at the county and/or multi-county level)
- Care/Facilities Selection (Statewide program typically offered at the county and/or multi-county level)
- Literacy Programs (Statewide program typically offered at the county and/or multi-county level)
- Parenting Education (Statewide program typically offered at the county and/or multi-county level)

PPA: Consumer Education

Issue Statement

As Mississippi moves into the 21st century, a population growth rate of 10.4 percent is anticipated over the next 6 years. This growth rate will be followed by a rate of almost 9 percent until the year 2015. The age composition will produce a greater proportion of people in the prime working ages, a growing fraction of women of childbearing age and result in an increased fraction of elderly.

Mississippi has experienced economic growth in the past few years but most Mississippians have not profited by increasing their base standard of living. Excessive costs related to goods and services continue to affect young families, single-parent families, the elderly and adults with disabilities.

Housing cost is one area where each of the aforementioned population groups struggle to find adequate affordable housing options. Economic prosperity throughout the state has failed to ease the affordable housing shortage. Supply of low rent housing has decreased rather than increased over the past five years, and a sharp increase in the number of working poor families needing housing assistance because of the population growth are factors that have disproportionately affected affordable housing availability.

Many of the very low income households earn less than 50 percent of the area median income and either pay over half their incomes for rent, live in severely substandard housing or both. More than 40 percent of Mississippi's population experience what is referred to as cost-burdened housing or spending more than 30 percent of their income on housing costs. This excessive cost-burdened housing negatively impacts the remaining portion of the family budget.

Emphasis on housing based on the family budget, household maintenance and repair, safe and secure surroundings along with adequate means to address immediate environmental issues such as water and energy conservation will provide the state's population a means of obtaining adequate and affordable housing.

As one of the three basic human needs, clothing is projected to experience the greatest percentage increase in consumption over the next six years. In Mississippi, apparel and textile-related needs and consumption will be especially affected by projected changes in population demographics since persons of prime working age and women of child-bearing age are the ones who spend most on these goods.

According to the Consumer Expenditure Survey of 1992, expenditure shares for apparel and related products and services by all U. S. households was almost 6 percent of their total expenditure. Bureau of Labor statistics indicate that per capita spending for apparel will increase by 18% in the 1996-2006 period. This will put even more pressure on the family budget.

Given the competing budgetary demands that impact all families, education in consumer buying, construction of apparel and household items, and wardrobe management for personal and professional development is needed to help them make better choices of the goods they buy and produce. Teaching basic construction skills via volunteer experienced home sewers offers consumers the opportunity to learn new skills and alternatives for increasing their purchasing

power. With nearly half of the labor force in Mississippi being women, pressures on both time and income are apparent. Using time and money wisely for acquisition and care of apparel and household textiles is of great importance to make more resources available for other needs.

New fiber developments and technology will drive the need for constant research and updating of consumer information. It is imperative that consumer education be an integral part of extension and research program development to meet the needs of all Mississippians, provide an avenue for financial stability and increase the quality of life for all populations.

Resources Allocated

MSU-ES: 5.11 FTE, $370,923 Total

Consumer Education – Clothing

Performance goals

1. Improve clothing skills of home sewers

Output Indicators

- Number of clothing workshop participants
- Increase in participation in Master Clothing Volunteer program
- Number of youth participating in 4-H Clothing Project

Outcome Indicators

- Improvement in clothing skills of program participants
- Scores of clothing projects

Key Program Components

- Master Clothing Volunteers
- 4-H Clothing Project
- Extension Program: Clothing

Internal and External Linkages

Multi-Institutional

- Bernina USA
- Viking machines
- Coats and Clarks
- Hancock fabrics, Inc
- Small fabric stores in MS

Target audiences

- Mississippi Families – Youth and Adults
- Home sewers

Program Duration

- Intermediate

Education and Outreach Programs

- Master Clothing Volunteers (Statewide program typically offered at the county and/or multi-county level)
- 4-H Clothing Project (Statewide program typically offered at the county and/or multi-county level)
- Extension Clothing Program (Statewide program typically offered at the county and/or multi-county level)

Consumer Education – Housing

Performance Goals

1. Increase home ownership rate for limited resource families.
2. Increase networking opportunities with agencies within the state of Mississippi to address adequate housing for all residents.
3. Decrease the energy usage in newly constructed homes by integrating energy efficient passive solar concepts in siting and orientation, heating and cooling strategies, construction techniques and materials and selection of major appliances based on the costs to purchase, operate and maintain.

Output Indicators

- Number of participants in home buyer education seminars.
- Number of classes actually taught in home buyer education.
- Number of home planning seminars actually taught.
- Number of participants in the home planning seminars.
- Publications (home buyer education, energy efficient home construction, utilization and financing)
- Number of realtors who attend the seminars.

Outcome Indicators

- Number of participants who actually complete the process of purchasing a home.
- Overall increase of homeownership in Mississippi.
- Number of consumers who adapt their future housing decisions based on teachings in the home planning seminars.
- Number of realtors who update their licenses with the continuing education hours offered.

Key Program Components

- Home Buyer Education
- Mississippi Housing Initiative
- Home Planning Seminars
- Training Component for Licensed Realtors
- Training Component for Contractors

Internal and External Linkages

Multi-Institutional

- Fannie Mae Foundation
- Fannie Mae Corporation
- Housing and Urban Development
- Mississippi Home Corporation

- Rural Development
- Mortgage Lending Institutions
- Non-profit Housing Agencies
- Local Power Cooperatives

Target Audiences

- Homeowners and Potential Homeowners
- Limited Resource Families

Program Duration

- Intermediate (home ownership for limited resource families; new home planning)
- Long (realtor education)

Education and Outreach Programs

- Home Buyer Education (Statewide program typically offered at the county and/or multi-county level)
- Mississippi Housing Initiative (Statewide program typically offered at the county and/or multi-county level)
- Home Planning Seminars (Statewide program typically offered at the county and/or multi-county level)
- Training Component for Licensed Realtors (Statewide program typically offered at the county and/or multi-county level)
- Training Component for Contractors (Statewide program typically offered at the county and/or multi-county level)

Consumer Education - Kenaf in Textiles/Textile Products

Performance Goals

1. Experiment with variations in fiber processing methods and fiber quality
2. Develop and evaluate nonwovens that incorporate kenaf, including investigation of kenaf/polypropylene in wall covering
3. Evaluate kenaf/cotton blends for performance in home interior products using standard test methods and survey of consumer evaluation/acceptance of products
4. Explore cooperative efforts that will lead to commercialization of kenaf-based products
5. Evaluate yarns and fabric blends already developed, looking at specific end uses and comparing with performance specifications.

Output Indicators

- Phases of research project completed
- Presentations to lay audiences and for state, regional and national meetings
- Refereed articles accepted/published

Outcome Indicators

- Kenaf-based textile products available in commercial markets; producers increasing acreage of kenaf to meet demand.
- Observation of increased interest and demand for kenaf by entrepreneurs, commercial firms and others

- Comparison of test results on kenaf-based yarns and fabrics to standards established for various textiles/textile products
- Consumer acceptance of kenaf textiles/products based on survey response.

Key Program Components

- Research project contributing to commercialization of kenaf, supporting its use as an alternative crop for Mississippi (and other) producers.

Internal and External Linkages

Multi-State

- S-272 Regional Research Committee working on project "Development and Assessment of Innovative Textile Materials for Environmental Compatibility and Human Health and Safety".

Multi-Disciplinary

- MSU interdisciplinary kenaf group.

Target Audiences

- Producers of soybeans and other crops which may be alternated with kenaf
- Industries which could incorporate kenaf into textile products
- Entrepreneurs who could develop products and markets for kenaf-based textiles/products
- Potential consumers of kenaf textiles/products

Program Duration

- Intermediate

Education and Outreach Programs

- None

PPA: Economic/Comm Development (ECD)

Issue Statement

Mississippi mirrors rural America in its diversity and complexity. It is a state primarily rural in nature with only 29 of its 298 municipalities having a population in excess of 10,000. Rural Mississippi communities, much like American communities in general, differ in their adjustment to the restructuring forces impacting the national economy. Some are adjusting and prospering, while many others, particularly the very small communities, have excessive levels of unemployment and poverty. In response to the ongoing restructuring of the national economy, the Commission on the Future of the South has noted that "the old rules and assumptions about economic development don't hold any more." The old model of manufacturing-driven development characterized by a high incidence of low-wage, low-skill job categories and the production of relatively simple mass-produced goods is precisely the segment of rural economies most adversely affected by restructuring. Rural Mississippi currently faces significant challenges as they strive to remain viable into the 21st century.

The President's Council on Sustainable Development describes sustainable communities as areas "that prosper because people work together to produce a high quality of life that they want to sustain and constantly improve." The term community constitutes the community of interests and relationships rather than one defined by geographic region. It is increasingly clear that overlap and interdependence exists between our core cities, suburbs, small towns and rural areas. Revitalizing and improving communities' ability to become sustainable is a primary focus of economic and community development. To become sustainable, rural communities need: strong diversified local economies that provide employment opportunities; the development of a social and physical infrastructure supportive of a healthy society; the development of community capacity--where local leaders and citizens have the ability to effectively address issues of priority importance to the community; investments in the development of human capital--improve skills and education of residents; and strengthening relationships and linkages among local and regional institutions and people that influence community well-being.

The university through its research and extension programs can:

- Assist with community, multi-community and multi-county strategic planning and visioning
- Facilitate creation of strong diversified economies
- Provide educational and leadership programs for local government officials and citizenry
- Assess infrastructure needs and identify alternatives to stimulate development
- Facilitate entrepreneurial activity through home-based and micro business ventures
- Integrate technology into business management, marketing and/or selling
- Improve access to information, technologies and resources needed to facilitate growth
- Share creative strategies for increasing the skills and assets that exist within every community
- Prepare and provide timely demographic and socioeconomic data and analyses to guide community decision-making

Resources Allocated

MSU-ES: 14.50 FTE, $1,299,462 Total

ECD - Community Leadership Development

Performance Goals

1. Increase number of communities/individuals involved in community development.
2. Broaden the pool of people trained in community development skills.
3. Increase understanding of public issues among Promoting Rural Opportunities in Mississippi (PRO-MISS) participants.
4. Increased capacity of public officials to govern.

Output Indicators

- Number of training sessions conducted
- Number of volunteers trained

Outcome Indicators

- Comparison with benchmarks of volunteer involvement
- Number or dollar value of grants received by community groups.

Key Program Components

- Participation in PRO-MISS
- Community Volunteer Training
- Coalition Building
- Grant Writing
- Education program for local Chambers of Commerce and Economic Development Foundations
- Organizational development
- Leadership program for county supervisors
- Educational programs addressing public issues such as natural resource conflicts.

Internal and External Linkages

Multi-Institutional

- MS Department of Economic and Community Development
- MS Rural Development Council, USDA Rural Development
- Appalachian Regional Commission
- Planning and Development Districts of Mississippi
- Southern Rural Development Center
- Tennessee Valley Authority (TVA), TVA Rural Studies Program
- Chambers of Commerce
- MS Center for Cooperative Development
- MS Department of Agriculture & Commerce
- Small Business Administration
- Small Business Development Centers
- MS State Department of Health
- Mississippi Association of Supervisors (MAS)
- Mississippi Municipal Association (MMA)
- Mississippi Association of County Officials (MACO)
- National League of Cities (NLC)
- National Association of Counties (NACO)
- International City/County Management Association (ICMA)
- State Government (Office of the State Auditor, Office of the Attorney General, State Tax Commission, Office of the Secretary of State, Mississippi Department of Environmental Quality, etc.)

Multi-Disciplinary

- MSU Social Science Research Center
- MSU Department of Agricultural Economics
- Community Resource Development
- MSU Agribusiness Institute
- MSU College of Business & Industry
- PRO-MISS Institute
- MSU Continuing Education
- Small Town Development Center
- Stennis Institute of Government
- Stennis Center for Public Service
- Geographic Information Systems

Target Audiences

- Local government officials and agency representatives
- Non-government sector leaders
- Civic-minded service organizations and clubs
- Planning and Development Districts
- Community & Economic developers
- Rural youth
- Chambers of Commerce
- Rural Fire Departments
- Mississippi Homemaker Volunteers
- Rural water system boards of directors

Program Duration

- Long

Education and Outreach Programs

- PRO-MISS (Statewide program typically offered at the county and/or multi-county level)
- Community Volunteer Training (Statewide program typically offered at the county and/or multi-county level)
- Education program for local Chambers of Commerce and Economic Development Foundations (Statewide program typically offered at the county and/or multi-county level)

ECD - Diversifying Rural Economies

Performance Goals

1. Increase capacity of communities to provide diversified challenging employment opportunities commensurate with skills of the local labor force.
2. Increase economic viability of local industries through a better understanding of inter-industry linkages.

Output Indicators

- Number of communities and industry prospects requesting and using information/data bases.
- Numbers of information/data base publications developed and distributed.

Outcome Indicators

- Employment growth by SIC code
- Number of businesses created, expanded and retained

Key Program Components

- Community-based instruction on national, regional, and local growth trends to insure continued viability of the local economic base.
- Awareness of information technologies and resources needed to guide community decision-making.
- Descriptions of natural resource, demographic, and socioeconomic data to guide community decision-making.
- Target impact and industry development analyses and asset mapping to facilitate planning in rural communities.

Internal and External Linkages

Multi-Institutional

- Department Economic and Community Development
- State Rural Development Councils
- Planning and Development Districts
- TVA, TVA Rural Studies Program
- Southern Rural Development Center

Multi-Disciplinary

- Community Resource Development
- Social Science Research Center
- Agricultural Economics
- Human Sciences

Target Audiences

- Planning and Development Districts
- Local government officials and economic developers
- Prospective business and industry prospects

Program Duration

- Long

Education and Outreach Programs

- Community-based instruction on national, regional, and local growth trends to insure continued viability of the local economic base. (Statewide program typically offered at the county and/or multi-county level)
- Descriptions of natural resource, demographic, and socioeconomic data to guide community decision-making. (Statewide program)
- Target impact and industry development analyses and asset mapping to facilitate planning in rural communities. (Statewide program)

ECD - Entrepreneurial & Business Development

Performance Goals

- Reduce business failures
- Facilitate community-based business growth and expansion through increased new business start-ups or improved/expanded existing businesses

Output Indicators

- Number of extension programs implemented
- Number of entrepreneurs/businesses owners/employees/community developers participating in extension programs
- Number of consultations conducted
- Number of feasibility studies completed
- Number of business retention and expansion surveys conducted and plans completed
- Number of extension agents trained
- Number of extension educational materials produced

Outcome Indicators

- Number of businesses started
- Number of business failures prevented
- Number of businesses improved and/or expanded

Key Program Components

Extension educational programs in:

- Home-Based & Micro Business Development
- Business Retention & Expansion
- Retail Development

Internal and External Linkages

Multi-Institutional

- Appalachian Regional Commission
- Chambers of Commerce
- MS Center for Cooperative Development
- MS Department of Agriculture & Commerce
- MS Department of Economic & Community Development
- Non-Profits
- Planning & Development Districts
- Small Business Administration
- Small Business Development Centers
- Southern Rural Development Center

Target Audiences

- Community Developers
- Entrepreneurs
- Industry

Program Duration

- Long

Education and Outreach Programs

- Home-Based & Micro Business Development (Statewide program typically offered at the county and/or multi-county level)
- Business Retention & Expansion (Statewide program typically offered at the county and/or multi-county level)
- Retail Development (Statewide program typically offered at the county and/or multi-county level)

ECD - Strategic Planning by Local Communities

Performance Goals

1. Communities will increase their access to key statistical information about their community.
2. Communities will strengthen their capacity to implement a strategic planning and visioning process
3. Communities will discover the diverse set of assets that exist among their citizenry

Output Indicators

- Databases developed to support local planning activities
- Number of Extension agents trained
- Number of communities trained
- Number of communities accessing statistical information resources
- Number of communities engaged in strategic planning activities
- Number of community who have implemented community asset mapping
- Curricula developed as tools for supporting strategic planning activities

Outcome Indicators

- Activities or programs implemented by communities reached by Extension strategic planning training efforts
- Individual improvement in involvement in community actions, or securing employment that better utilized their skills.

Key Program Components

- A network of data bases that offer information useful for local community issues
- Principles of strategic planning and visioning
- Community asset mapping
- Training for community leaders and other civic-minded local residents

Internal and External Linkages

Multi-Institutional

- MS Department of Economic and Community Development
- MS State Rural Development Council
- USDA State Rural Development Office
- Appalachian Regional Commission
- Planning and Development Districts
- Southern Rural Development Center

Target Audiences

- Local government officials and agency representatives
- Non-government sector leaders
- Local businesses and entrepreneurial firms

- Civic-minded service organizations and clubs
- Local citizens

Program Duration

- Long

Education and Outreach Programs

- Principles of strategic planning and visioning (Statewide program typically offered at the county and/or multi-county level)
- Community asset mapping (Statewide program typically offered at the county and/or multi-county level)
- Training for community leaders and other civic-minded local residents (Statewide program typically offered at the county and/or multi-county level)

ECD - Local Government Officials Education

Performance Goals

1. Improve local government officials' knowledge and understanding of their duties and responsibilities--those mandated by law and those necessary for development of an effective, efficient governmental unit.
2. Improve local government officials' ability to access, assess, and interpret information relevant to the performance of their duties and responsibilities.
3. Improve local government officials' ability to respond effectively to short-term and long-term problems and challenges, including shifts and changes in state and federal policies applicable to local government.

Output Indicators

- Number of programs delivered.
- Number of local government officials participating in educational programs.
- Major publications developed to assist local government officials.
- Number of requests for technical assistance.

Outcome Indicators

- Number of Governmental Units Indicating Change in Processes and Procedures.
- Reduction in Number of Lawsuits Filed Against Units of Government Concerning Processes and Procedures.
- Reduction in Number of Public Officials Charged with Violation of Laws Concerning Duties and Responsibilities.

Key Program Components

- Orientation programs for newly elected officials.
- Educational programs addressing duties and responsibilities.
- Educational programs addressing the collection and interpretation of information relevant to performance of duties and responsibilities.
- Educational programs addressing techniques of problem solving applicable to local government.

Internal and External Linkages

Multi-Institutional

- Mississippi Association of Supervisors (MAS)
- Mississippi Municipal Association (MMA)
- Mississippi Association of County Officials (MACO)
- National League of Cities (NLC), National Association of Counties (NACO)
- International City/County Management Association (ICMA)
- Planning and Development Districts of Mississippi
- Southern Rural Development Center
- State Government (Office of the State Auditor, Office of the Attorney General, State Tax Commission, Office of the Secretary of State, Mississippi Department of Economic and Community Development, Mississippi Department of Environmental Quality).

Multi-Disciplinary

- Center for Governmental Technology
- Stennis Institute of Government
- Stennis Center for Public Service
- Social Science Research Center
- Department of Agricultural Economics

Target Audiences

- 3,000 elected municipal officials, 2,000 appointed municipal officials, 410 elected county supervisors, 500 other elected county officials, and 150 appointed county officials.

Program Duration

- Long

Education and Outreach Programs

- Orientation programs for newly elected officials. (Statewide program typically offered at the county and/or multi-county level)
- Duties and Responsibilities of Government Officials program. (Statewide program typically offered at the county and/or multi-county level)

PPA: Financial Management

Issue Statement

Mississippi is a predominantly rural state, with almost 53% of the state's population residing in rural areas. Many of these people are employed in Mississippi's agribusiness system. Total employment was about 1.25 million in all sectors of the agribusiness system in Mississippi in 1992. Wages and salaries of those employed in the agribusiness system totaled $23.8 billion in 1992. However, on a per capita basis, for those employed in the agribusiness system, annual salaries and wages are only about $19,000. This concurs with the state's per capita personal income, for which Mississippi ranks 50th among states, at only $18,087.

The large proportion of Mississippi residents living in rural areas and employed in production agriculture and other sectors of the agribusiness system, coupled with their low per capita wages and salaries, suggests the need for focused efforts to improve the financial management abilities of rural Mississippians. Improved financial management, reflected in improved decision making, is central to building equity, which, in turn, is a key to attaining financial flexibility and well-being, whether in a business or household. By building equity, individuals and businesses can broaden their financial opportunities. In contrast, decreased savings rates, increased consumer and business debt, and inadequate retirement planning, are reflective of deficiencies in personal and business financial management training.

Priority needs to be addressed through business and personal financial management training for rural Mississippians include the following:

- consumer and business decision making
- setting financial goals
- achieving firm growth
- budgeting
- personal and business financial record keeping
- financial statements-development and analysis
- debt reduction
- investments and investment analysis
- retirement planning
- estate planning
- income tax planning
- protecting equity

Resources Allocated

MSU-ES: 9.12 FTE, $658,846 Total

Fin. Mgt. - Family Financial Management

Performance Goals

1. Families will improve their personal net worth by increased savings and reduced debt.
2. Families will increase the adoption of estate planning strategies.
3. Youth will increase financial management knowledge and improve consumer skills.

Output Indicators

- Number of educational activities conducted
- Number of adult participants reached
- Number of youth participants reached
- Number of limited-resource participants reached
- Publications/curricula developed or revised

Outcome Indicators

- Number of participants who build savings
- Number of participants who reduce debts
- Average dollar amount of money saved by participants
- Average dollar amount of debt reduction by participants
- Number of participants who complete an estate planning instrument (e.g., will, advance directive, etc.)
- Percentage increase of scores of post-test over pre-test of High School Financial Planning Program
- Average score of Consumer Judging Activity participants

Key Program Components

- Curricula/Publications
  - Money 2000
  - Money Matters
  - Money Smart
  - Money in Your Pocket
  - Getting on Financial Track
  - Money and You (tri-state program)
  - High School Financial Planning Program
  - 4-H Consumer Judging
  - Dollarwatch: Money Management Master Volunteer Program
  - Planning Your Estate
  - PowerPay Debt Reduction Program
  - Women's Financial Information Program (WFIP)

- In-Service Education
  - Dollarwatch: Money Management Master Volunteer Program
  - Money and You (tri-state program)
  - PowerPay Debt Reduction Program
  - How to Start and Maintain an Investment Club
  - Consumer Judging Activities
  - District Contests
  - State Contest
  - Mid-South Fair Contests

Internal and External Linkages

Multi-State

- Limited-Resource Management Program Planning Group (AR, LA)
- Mid-South Fair Youth Committee (AR, TN, KY)

Multi-Institutional

- National Endowment for Financial Education
- Banks and Other Financial Institutions

Target Audiences

- Families, Youth
- None
- Limited-Resource Families (Money Smart, Money in Your Pocket, Getting on Financial Track, Dollarwatch: Money Management Master Volunteer Program, Money and You)

Program Duration

- Intermediate

Education and Outreach Programs

- Money 2000 (Statewide program offered at the county and/or multi-county level)
- Money Matters (Statewide program offered at the county and/or multi-county level)
- Money Smart (Statewide program offered at the county and/or multi-county level)
- Money in Your Pocket (Statewide program offered at the county and/or multi-county level)
- Getting on Financial Track (Statewide program offered at the county and/or multi-county level)
- Money and You (tri-state program) (Statewide program offered at the county and/or multi-county level)
- High School Financial Planning Program (Statewide program offered at the county and/or multi-county level)
- 4-H Consumer Judging (Statewide program offered at the county and/or multi-county level)
- Dollarwatch: Money Management Master Volunteer Program (Statewide program offered at the county and/or multi-county level)
- Planning Your Estate (Statewide program offered at the county and/or multi-county level)
- PowerPay Debt Reduction Program (Statewide program offered at the county and/or multi-county level)
- Women's Financial Information Program (WFIP) (Statewide program offered at the county and/or multi-county level)

Fin. Mgt. - Farm Business Financial Management

Performance Goals

1. Increase the use of budgets and financial records in farm operations.
2. Improve the ability of producers to use measures of financial performance and position in farm decision making.
3. Increase adoption of retirement planning and estate planning strategies.

Output Indicators

- Number of Extension programs delivered to producers
- Number of producers participating in Extension programs
- Publications (Departmental reports, MAFES reports, Extension publications, non-refereed articles, refereed journal articles)
- Case studies

Outcome Indicators

- Identify number of producers who start keeping and using financial records
- Monitor changes in equity position of producers over time
- Aggregate measures of performance by the Mississippi agricultural sector

Key Program Components

- Farm Financial Management Training for Producers
- In-Service Training

Internal and External Linkages

Multi-Institutional

- Farm Service Agency, USDA

Target Audiences

- Producers and their families (MPACT Program, FSA Borrower Training Program)

Program Duration

- Long

Education and Outreach Programs

- Farm Financial Management Training for Producers (Statewide program offered at the county and/or multi-county level)

PPA: Food and Food Products

Issue Statement

Food processing is an $18 billion dollar sector of the Mississippi manufacturing industry. With 32,000 workers earning an annual payroll of over $550 million in 216 businesses around the state, it is the largest manufacturing employment sector in the state's economy. The poultry industry continues to be dominant in the industry statewide. Mississippi is now the 4th largest broiler producing state in the U.S. Almost all of the broilers produced in the state are processed in one of 17 poultry processing plants. The annual farm-gate (live) value of poultry and eggs exceeds $1.4 billion. With increased domestic consumption and strong export markets, poultry will continue to be a growth industry in the state. In addition to poultry, Mississippi production of catfish, rice, pecans and sweet potatoes ranks among the top ten in the nation. Mississippi is the leading supplier of farm-raised catfish in the nation with 16 processors in operation in 1998. The red meat industry consists of over 100 processing companies and the largest single plant has annual sales approaching $1 billion. While existent, fruits and vegetables, fats and oils, dairy and bakery products are less significant in the overall mix of revenues generated and/or employment. Tracking with national growth trends, the state's specialty foods industry is making tremendous gains in the state as well. Recent survey data indicate annual sales of over $21 million with less than half the known firms reporting.

With 46% of the total food expenditures going to purchases of food consumed away from home, more emphasis must be placed on capturing shares of the consumer's food expenditures going to processing and marketing, now at 77% of each dollar. New food products, convenience and more preparation seem to be the continued trend. With the food processing industry growing and consumption of minimally processed and ready-to-eat foods increasing, more research efforts are also needed to address food safety issues

Priority needs for research and extension efforts in food and food products have been identified through interaction with extension specialists and research scientists and from information gathered from industry representatives and agricultural-related organizations. Priority needs are outlined as follows:

- Quality assurance program development and in-plant implementation assistance
- Impact assessment and strategic planning for the food industry sector
- Proliferation of high quality, lower fat foods for conventional sales opportunities as well as for institutional purchases and school feeding programs
- An effort to educate all citizens of the state about the nutritional contributions of various foods and how to reduce or eliminate problems related to traditional food safety issues
- Research and development in new food ingredients and products
- Research in new food processing, preservation, and marketing techniques
- Development of rapid methods to detect food borne pathogens and insure food safety predictive tests for shelf life and product safety

Resources Allocated

MSU-ES: 1.64 FTE, $151,077 Total
MAFES: 5.41 FTE, $1,389,829 Total

Food and Food Products - Business Feasibility

Performance Goals

1. Assist statewide industrial recruitment and development efforts in locating and/or expanding food businesses in Mississippi
2. Develop feasibility studies for food enterprises
3. Conduct economic analyses and management evaluations for existing food businesses

Output Indicators

- Number of requests for assistance
- Number of studies completed
- Number of industry publications developed

Outcome Indicators

- Businesses expanded or retained in Mississippi
- Businesses started in Mississippi

Key Program Components

- Provide process flow and facility layouts for food businesses
- Evaluate various record keeping software for business and inventory management systems
- Assist in development of pro forma financials and strategic plans for food-related businesses
- Collaborate with food scientists and economists in regional food industry studies
- Refer clientele to supply sources and assistance in other states
- Participate in regional and national workshops and conferences providing trend analyses for the food industry

Internal and External Linkages

Multi-State

- Land-grant universities
- Economic Development Agencies
- Product specific associations, e.g., catfish, poultry

Multi-Institutional

- Mississippi Department of Economic and community Development
- Mississippi Technology Extension Partnership
- Other universities and community colleges
- Mississippi Department of Health
- Mississippi Department of Environmental Quality

Multi-Disciplinary

- College of Engineering
- College of Business and Industry
- College of Agriculture and Life Sciences

Target Audiences

- Economic Developers and industrial recruiters
- Catfish, poultry and other meat companies

Program Duration

- Intermediate

Education and Outreach Programs

- Provide process flow and facility layouts for food businesses (Statewide program)
- Evaluate various record keeping software for business and inventory management systems (Statewide program)
- Assist in development of pro forma financials and strategic plans for food-related businesses (Statewide program)

Food and Food Products -Specialty Foods Business Development

Performance Goals

- Increase probability of success of new or expanding food businesses by providing technical assistance in packaging and labeling of food products.
- Improve opportunity for survival and growth of food firms by providing hands-on assistance with business and inventory management issues.
- Assure compliance with government regulations governing good manufacturing procedures by providing educational workshops to address these issues.

Output Indicators

- Number of clients receiving quarterly newsletter and other materials
- Number of in-plant visits made
- 'Food as a Business' workshops conducted
- Number of 'Record keeping using Quicken/Quickbooks' sessions

Outcome Indicators

- Number of businesses started
- Increases in employment by existing firms
- Changes made in record keeping systems
- Improved profitability

Key Program Components

- Publish a quarterly Specialty Foods Industry Newsletter to provide information on topics of concern and interest to the industry.
- Provide client-specific, in-plant assistance on an as needed basis
- Encourage networking among clientele to foster non-formal educational exchanges
- Assist in development of business plans

Internal and External Linkages

Multi-Institutional

- Mississippi Department of Agriculture and Commerce
- Mississippi Department of Economic and Community Development
- Small Business Development Centers
- Small Business Administration
- Other university and community college collaborators
- Mississippi Technology Extension Partnership
- Mississippi Specialty Foods Association

Multi-Disciplinary

- College of Business and Industry
- College of Agriculture and Life Sciences
- Mississippi State Chemical Laboratory

Target Audiences

- Entrepreneurs
- General Public

Program Duration

- Intermediate

Education and Outreach Programs

- Specialty Foods Industry Newsletter to provide information on topics of concern and interest to the industry. (Statewide program)
- Client-specific, in-plant assistance on an as needed basis (Statewide program)
- Assist in development of business plans (Statewide program)

PPA: Forest Products

Issue Statement

The forest products industry in Mississippi is the largest contributor to the state economy. Total Mississippi economic impact from the industry, including furniture manufacturing, is $11.4 billion, while value-added by the industry is $4.9 billion.

The forest products industry is fragmented into many firms and includes a large number of small firms engaged the manufacture of a wide variety of wood based products. For this reason, the research and development pursued by the industry compares more closely to American agriculture than to heavy industry. As in the case of agriculture, there is a continuing need in the forest products industry to develop and transfer improved methods with the aim of increased productivity and reduced costs.

Priority needs for research and extension efforts in forest products have been identified by the Forest Products Laboratory Advisory Committee. Advisory Committee members are largely forest products industry managers involved in manufacturing activities.

- Improvements in manufacturing systems
- Reduction in raw material costs
- Improved durability of both solid wood and composite products
- Development and application of quality assurance methods
- Preservation and improvement of environmental quality

Resources Allocated

MSU-ES: 0.80 FTE, $80,000 Total
FWRC: 12.90 FTE, $3,124,628 Total

Forest Products

Performance Goals

1. Forest products industries will increase raw material to product conversion efficiency
2. Productivity of the forest products industry will increase
3. Durability of forest products will increase
4. Forest products industry sites will be safe, environmentally enhanced and/or protected
5. Students and adults will increase their understanding of environmental and economic issues that impact the forest industry.

Output Indicators

- Number of participants in technical assistance and education programs
- Number of patents, publications, presentations, seminars, short courses, conferences, newsletters, plant visits, telephone consultations, reports, and letters.
- Number of undergraduate and graduate degrees conferred.

Outcome Indicators

- Cost of raw materials before/after
- Manufacturing productivity before/after

- Participant satisfaction with information received
- Research, industry and consumer reports on improved forest products durability
- Acreage of environmentally enhanced and protected land
- Industry adoption safety programs

Key Program Components

Technology Transfer

- Analyze current plant layouts, and propose and test alternative systems
- Develop quality assurance programs and train quality assurance personnel
- Develop user-friendly software to analyze manufacturing problems
- Optimize machining and sawing processes
- Trouble shoot industrial systems
- Develop linear programming models and software to:
  - minimize costs
  - optimize distribution networks
  - minimize profit
- Perform investment analyses to justify equipment investments
- Develop business plans for current or start-up companies
- Conferences, seminars and workshops for Mississippi industries
- Provide information to consulting agencies that service industry needs
- Develop in-plant training workshops for employees
- Provide marketing analysis
- Assist in development of, and compliance with, federal, state and industry standards
- Cooperate with economic development agencies to promote domestic and foreign investment in the state's industrial development
- Provide chemical analysis and information to solve processing problems
- Provide information regarding opportunities for product import and export
- Develop and participate in programs that increase public awareness of the importance of forest products to the economy of Mississippi and its citizens.

Environmental Enhancement and Protection

- Develop methods for lowest-cost disposal of hazardous industrial wastes
- Assist in developing recycling and reuse options for industrial wastes and by-products
- Bioremediation of sites polluted with industrial wastes
- Bioremediation of industrial emissions.

Materials and Products Testing

- Perform analysis and specialized tests to determine chemical, mechanical and physical properties of manufactured products and raw materials including solid wood, wood-based composites, metallic tooling, fasteners, foam and fiber cushion materials, etc.
- Perform strength, wear, fire resistance, ash content, and other tests of solid wood, wood composites, paper, tooling, plastic, fabric, and foam cushion materials, etc.
- Perform packaging tests
- Determine optimum machine tool geometry and materials
- Evaluate design and performance parameters of components and subassemblies

Technology Development

- Development of technology for industries involved in:
  - wood composites
  - lumber manufacturing

  - wood preservation
  - biotechnology
  - wood chemicals
- Optimize chemical parameters to improve product performance (i.e., adhesives, preservatives, pulping chemicals)
- Analyze chemical constituents of natural and manmade components
- Develop automated manufacturing methods and equipment
- Develop improved methods for preventing insect and microbial degradation and improving the dimensional stability of manufactured products
- Analyze the future raw materials supply situation for the forest products and furniture industries
- Evaluate alternative renewable resources including recycled materials for inclusion in composite products

Outreach
- Technical assistance: publications, seminars, short courses, conferences, newsletters, plant visits, presentations, telephone consultations, reports, letters
- Performance testing
- Business reviews: business plan and long-term strategy development, plant layout and expansion

Internal and External Linkages

Multi-State
- Alabama International Trade Association
- American Furniture Manufacturers Association
- American Wood Preservers Association
- Appalachian Regional Commission
- Department of Army via U.S. Forest Service
- Department of Energy via Institute of Paper Science & Technology
- Department of Transportation
- Environmental Protection Agency
- Forest Products Society
- Institute of Paper Science and Technology
- Michigan State University
- National Council for Air and Stream Improvement
- National Science Foundation
- North Carolina State University
- PanelWorld Magazine
- Railway Tie Association
- Society of American Foresters
- Society of Wood Science and Technology
- Southeastern Lumber Manufacturers' Association
- Southern Forest Products Association
- Southern Pressure Treaters Association
- Tennessee Valley Authority
- U.S. Forest Service
- U.S. Department of Commerce

Multi-Disciplinary
Mississippi State University:

- Agricultural Economics
- Agricultural and Biological Engineering
- Biochemistry and Molecular Biology
- Chemical Engineering
- College of Business and Industry
- College of Engineering
- Department of Chemistry
- Department of Entomology
- Department of Industrial Technology
- Division of Continuing Education
- Department of Plant and Soil Sciences
- Office of International Programs
- State Chemistry Laboratory

Target Audiences

- Forest product industry owners, managers, and other employees
- Elementary and Junior High School students, Forest Products graduates and undergraduate students, and educators
- Industry Associations, regulatory and policy making organizations
- Economic development organizations and foundations

Program Duration

- Long

Education and Outreach Programs

- Forest Products Technical Assistance (publications, seminars, short courses, conferences, newsletters, plant visits, presentations, telephone consultations, reports, letters) (Statewide program)
- Performance testing (Statewide program)
- Business reviews: business plan and long-term strategy development, plant layout and expansion (Statewide program)

PPA: Leadership Development

Issue Statement

Mississippi faces major challenges as the 21st century nears. It is a rural state with more than 50 percent of the state's population living in these areas. Only 11 of Mississippi's 82 counties have a municipality of 20,000 or more population. Population density exceeds 100 persons per square mile in only nine counties.

Compared with urban settings, life in rural Mississippi is characterized by relatively low income, lower levels of education, restricted access to cultural amenities and other infrastructure needs, resulting in fewer opportunities to improve the quality of life. Other factors serve to sharpen the difficulties faced by people in rural areas as they try to deal with social, economic, and institutional issues. These deficits have left some communities totally lacking in the skills to cope with the myriad of social issues needed to move ahead.

Rural areas lack the large cadre of professionally trained and experienced development specialists when compared to their urban counterparts. Other complicating factors: exportation of jobs to foreign countries; local governments forced to assume more responsibility in providing needed services and facilities as a result of federal and state policy changes. Human and financial resources in rural Mississippi are strained so they cannot keep pace with growing demands.

Throughout its history, Extension has partnered with citizens, local leaders, and local government officials to identify and acquire the knowledge and strategies needed to address public issues effectively. Through leadership and volunteer development programs, Extension has made and will continue to make major contributions toward the preparation of citizens and local government officials for strengthening organizations and communities.

While efforts at developing leadership and strong volunteers are sometimes conducted as separate programs, Extension staff must engage in leadership and volunteer development as an integral part of furthering the instructional aims of all programming. Leadership development builds the capacity to address issues faced by communities.

Extension strategies for assisting clients whose concern is public well-being are as follows:

- To build the leadership and volunteer capacity of individuals, groups, organizations and communities to take action for public well-being.
- To assist clients in developing skills for establishing and strengthening effective partnerships and collaborations.
- To implement public issues education as a way of encouraging groups and organizations to take action.
- To prepare leaders and volunteers to serve in a variety of groups and organizations.
- To enhance the capacity of communities and groups to address a wide range of public issues by enhancing their abilities to engage in long-term planning, create organizational structures and muster resources.

Resources Allocated

MSU-ES: 25.93 FTE, $1,633,769 Total

Leadership Development - Volunteers

Performance Goals

1. To build leadership and volunteer capacity of individuals, groups and organizations to take action resulting in public well-being.
2. Prepare community leaders, officials, and volunteers to serve in a variety of groups and organizations.
3. Assist clientele in developing skills for establishing and strengthening effective partnerships and collaborations.
4. Continue to train volunteers in public policy decision making, handling and working with elected officials on the importance of having a voice.
5. Enhance the capacity of individuals, groups, and communities to address a wide range of public issues by strengthening their abilities to engage in long-term planing and creating organizational structure and other resources.

Output Indicators

- Number of volunteers, community leaders, and local officials completing and participating in non-format education programs on youth and adult development, community-decision-making, and leadership development.
- Number of programs implemented for clientele.
- Number of volunteers, community leaders, and local officials participating in Extension Programs.
- Publications, studies, and other printed materials developed for clientele.
- Number of articles pertaining to leadership development and community decision-making.
- Number of activities and projects conducted.
- Number of learning packets distributed.
- Number of requests for assistance.

Outcome Indicators

- Survey to determine the leadership ability of participants before and after their involvement in the program.
- Reports of participation with different groups and organizations involving clients.
- Identify changes in program participants and community involvement
- Reports of participation in public policy planning and decision making.

Key Program Components

- Pinpoint specific issues for today's leaders, officials, and volunteers and focus MSUES' efforts to help them meet the challenges. These issues will be reevaluated periodically to enable MSUES to change programming as needed to meet changing needs.
- Examine our existing programs and materials to make certain they are useful to all clientele.
- Implement public issues education as a way of encouraging individuals, groups, and organizations to take action in their communities.
- Provide agent in-service training in the following areas:
  - Parliamentary procedures
  - Networking
  - Collaboration/Coalition building
  - The art of delegating
  - The role of strong facilitators

  - Communication skills
  - Listening skills
  - Community Assessment
  - Economic Analysis
  - Parenting Education
  - Family Life Education
- Provide workshops and program specific materials
- Provide one-on-one training
- Provide publications
- Provide project specific studies
- Provide electronic media helps
- Provide expert teams for educational and technical assistance as required by program participants.

Internal and External Linkages

Multi-State

- Tri- State Ministers

Multi-Institutional

- Mississippi Department of Human Service
- American Cancer Society
- Mississippi Salvation Army
- Mississippi Fruit & Vegetable Growers Association
- Mississippi Peach Growers Association
- Mississippi Pecan Growers Association
- Southern Pecan Growers Association
- Mississippi Commission for Volunteer Service
- Mississippi Tourism Committees
- Mississippi Early Childhood Association
- Mississippi State Department of Health
- Mississippi State Department of Education
- Mississippi Bishops Association
- Mississippi Elementary Principals Association
- Mississippi High School Principals Association
- Mississippi Superintendents Association
- Mississippi School Boards Association
- Mississippi Community College Presidents Association
- Institutions of Higher Learning
- Panhellenic Council
- First Steps
- Local Chamber of Commerce
- "Main Street" Programs
- Local Headstart Programs
- Local Community Action Agencies
- United Way
- County Tourism Committees

Multi-Disciplinary

- Southern Region Leader Forum Planning Committee

Target Audiences

- Families and Youth
- Mississippi Homemaker Volunteers
- Master Clothing Volunteers
- Master Teachers in Family Life and Education
- Local Officials and Decision-Makers
- Master Gardeners
- Master Naturalists
- 4-H Volunteers

Program Duration

- Intermediate

Education and Outreach Programs

- Master Volunteer Programs (Statewide programs typically offered at the county and/or multi-county level):
  - Mississippi Homemakers Volunteers
  - 4-H Volunteers
  - Master Naturalist Program
  - Master Clothing Volunteers
  - Master Gardeners
  - Master Teachers in Family Life

PPA: Safety

Issue Statement

Mississippi ranks number one in the nation in motor vehicle and fire fatalities (per capita). In 1997, 76,237calls (23% of the total calls received by the emergency medical service) involved trauma. The three leading categories were motor vehicles (56%), falls (23%) and violence (13%). Mississippi leads the nation in fire deaths each year with approximately 41.2 deaths per 1,000,000 residents (100 per year). Drowning accounts for about 75 deaths per year. Approximately 66% of the drowning and fire deaths to those under 16 years of age are black youth. Many involve farm ponds or small lakes near the rural home.

Tractors and farm machinery account for 20 to 28 deaths / year. Approximately 2/3 of the tractor and machinery deaths involve the rural homeowner and/or part time farmer who is maintaining a rural residential grounds with older and often poorly maintained equipment without current safety devices. Tractor roll-overs account for 45%, run-overs, rotary cutters and wrecks with motor vehicles account for 18%, 10% and 6% respectively of all tractor deaths. Age of accident victims range from approximately 2 years to 102 years. Numerous other less fatal accidents produce severe injury to the rural homeowner and youth who use outdoor power equipment such as lawn care equipment and chain saws.

Modern agriculture is electricity dependent. Stand-by generators are used for power in the event of power outages. Electrical wiring in poultry houses, aerators for fish ponds and other outdoor electrical equipment must withstand harsh environments of dust and corrosive gasses, high humidity and water, resulting in frequent replacement of components, often without the assistance of a qualified electrician. The poultry industry workers and grain and feed handlers are exposed to these same dusts and gases. Poultry workers are usually the owner / operators of the houses and their family members who are less likely to take the necessary precautions to protect themselves from electrical shock and respiratory problems than trained workers within another industry.

Based on a review of programs, safety advisory council input and continued monitoring of vital statistics within the state the following needs were identified:

- Improved fire prevention strategies and awareness
- Water safety programs for rural youth
- Tractor and machinery safety programs for youth and adults
- Electrical safety for youth, the family and agricultural industries
- Respiratory hazard awareness in agriculture
- Dealing with trauma in the rural environment
- Improved outdoor power equipment operator skills and safety
- Youth safety in the rural and farm environment
- ATV Safety for Youth and Adults
- Bicycle Safety for Youth

Resources Allocated

MSU-ES: 3.62 FTE, $270,846 Total

Safety - AgrAbility

Performance Goals

1. Increase awareness of AgrAbility Project among disability service providers within the state and neighboring states.
2. Improve ability of disability service providers to recognize uniqueness of an agricultural vocation for people with a disability
3. Increase ability of disability service agencies to meet clientele needs

Output Indicators

- Number of training sessions conducted and persons trained
- Number of awareness events and contacts made
- Media Exposure
- Number of clients served

Outcome Indicators

- Number of clients utilizing engineering assistance and assistive technology
- Numbers of client referrals made by disability service providers

Key Program Components

- Awareness training of disability agency personnel
- Network development with disability agencies, farm industry support companies and institutions serving disabled clientele
- Direct service and coordination of farm sector services for disabled agricultural workers and their families.
- Provide engineering services to disability services agencies to assist agriculturally inclined clientele.

Internal and External Linkages

Multi-State

- AgrAbility Project states and Breaking New Ground Project staff.
- Assist neighboring states without AgrAbility Projects

Multi-Institutional

- Farm machinery manufacturers
- Easter Seals of Mississippi and National Easter Seals
- Mississippi Farm Bureau
- Agricultural supply industry member companies
- Southern Ginners Association
- Electric utility companies

Target Audiences

- Disability service providers
- Persons with a disability who desire to work in an agriculturally related occupation
- Agricultural supply industry personnel.

Program Duration

- Intermediate

Education and Outreach Programs

- Direct service and coordination of farm sector services for disabled agricultural workers and their families. (Statewide program)
- Provide engineering services to disability services agencies to assist agriculturally inclined clientele. (Statewide program)

Safety - Farm Safety

Performance Goals

1. Increase rural and farm population knowledge and practice of safety with machinery
2. Reduce death and injury from farm machinery accidents among the state's rural and farm populations
3. Improve the health and safety of rural and farm youth and adults who live and work in agricultural areas.

Output Indicators

- Number of training activities conducted
- Numbers of youth and adults participating
- Number of public service announcements produced and aired
- Publications and media materials developed and distributed

Outcome Indicators

- Shift in number and types of accidents, injuries and deaths
- Rural residents retrofitting older tractors with ROPS

Key Program Components

- Develop and distribute Public Service Announcements to the residents of the state on Fire Prevention/Safety in the rural environment, Water Safety around Farm/Rural Ponds, Lakes and Streams and Machinery Safety for the Rural Resident.
- Develop and distribute materials on farm machinery safety and maintenance for safer equipment.
- Work with additional youth through Farm Safety Day Camps, 4-H and FFA chapters to teach improved safety habits to future equipment operators.
- Develop and distribute materials on the needs for, selection and proper respirator equipment for a poultry house worker.
- Work to develop a relationship with the poultry integrators and electric power suppliers within the state to help in distributing materials in a timely manner to their contract growers and develop a funding source to address future needs.
- Continue to work with the Logger Education Specialist and the State's Loggers' Association to conduct Logger Education and Safety programs.
- Develop materials for the catfish farmers including a safety video and accompanying workers guide to promote safety among fish farm workers.
- Identify key individuals within the commodity and service organizations in the state who have farm safety interest. Involve these individuals in program planning and implementation to insure that program content matches the needs of their clientele.

Internal and External Linkages

Multi-Institutional

- Catfish Farmers of America
- Farm Bureau
- Electric Utilities Suppliers
- Poultry Integrator Companies

Target Audiences

- Poultry Integrators
- Loggers Association Members
- Catfish Farmers of America Members
- Insurance Providers
- Cotton Industry Organizations
- Farm Equipment Dealers
- Soybean Association Members
- Electric Utility Providers
- Mississippi Agro-Medicine Program
- Alcorn State University School of Nursing
- Mennonite communities
- Rural and Farm Youth

Program Duration

- Long

Education and Outreach Programs

- Fire Prevention/Safety in the Rural Environment (Statewide program typically offered at the county and/or multi-county level)
- Water Safety around Farm/Rural Ponds, Lakes and Streams (Statewide program typically offered at the county and/or multi-county level)
- Machinery Safety for the Rural Resident (Statewide program typically offered at the county and/or multi-county level)
- Farm Safety Day Camps (Statewide program typically offered at the county and/or multi-county level)
- Logger Education Program (Statewide program typically offered at the county and/or multi-county level)

Safety – Youth Safety

Performance Goals

1. Reduce injuries and deaths of rural youth.
2. Increase knowledge and awareness of good farm safety practices among youth and adults
3. Increase youth and adult knowledge of the cost of farm accidents and disabilities

Output Indicators

- Number of day camps conducted
- Numbers of youth and adults participating
- Number of public service announcements produced and aired
- Publications and media materials developed and distributed

Outcome Indicators

- Rate of accidents, injuries and deaths for children under 18 years
- Requests for publications and information.
- Rural residents retrofitting older tractors with ROPS

Key Program Components

- Farm Safety Day Camps
- Public Service Announcements to Rural Audiences
- Train youth in safe operation of farm equipment

Internal and External Linkages

Multi-State

- Regional Safety Programs and Materials Development

Multi-Institutional

- Alcorn State University
- Mississippi Agro Medicine Program
- Progressive Farmer Magazine
- Machinery Companies and Local Sponsors

Target Audiences

- Mississippi youth between 4th. And 12th. grades
- Rural Mississippi youth and adults

Program Duration

- Intermediate

Education and Outreach Programs

- Farm Safety Day Camps (Statewide program)

PPA: Wildlife & Fisheries

Issue Statement

Mississippi is rich in wildlife and fisheries resources that are important to its heritage, culture and economic well-being. In 1996, state residents and non-residents aged 16 years and older spent $1.8 billion in consumptive and non-consumptive wildlife-related recreation. In the same year, 680,000 Mississippians (16 years or older) fished, hunted or watched wildlife. Most of Mississippi is either privately owned or industrial forest or agricultural land with a high potential for fish and wildlife production and management. Many landowners do not know how to manage their land properly for different species of these resources, and need current research-based information. Much of the state's 18.2 million acres of commercial and private forestland, 225,000 acres of small impoundments, 14,205 miles of streams and rivers, and 13 million acres of agricultural open lands is not managed for wildlife/fisheries. Additionally, opportunities for quality recreational experiences and/or additional revenue generation through development of wildlife/fisheries related enterprises exist on Mississippi land bases for property owners and resource stakeholders.

Sociological and demographic changes associated with increased urbanization and changing lifestyles, coupled with greater public demand for enjoyment of wildlife and fisheries resources, have led to new dilemmas in conservation issues, as well as user conflicts. These dilemmas are frequently compounded by increased public awareness and involvement in issues such as endangered/threatened species conservation, traditional hunting/fishing activities, environmental stewardship and quality of life, wildlife/fisheries population management, ecosystem restoration and habitat management, and agricultural and agroforestry intensification.

To address current and future challenges in wildlife and fisheries management, Mississippians need accurate and reliable information. This need can be met through well-designed and executed research, combined with pro-active, client-driven extension programming. Advisory and client input groups have helped identify the following priority/need areas:

- Development and refinement of management strategies for sustainable wildlife and fisheries resources
- Integration of fish and wildlife conservation with other land uses
- Impacts of intensive agricultural and agroforestry on wildlife/fisheries habitats and populations
- Economic impacts and business opportunities of wildlife/fisheries related activities
- Youth life-skills development through conservation and hunting/fishing education
- Adult education concerning fish and wildlife management on private lands
- Wildlife/human interaction and conflicts
- Continuing professional education

Resources Allocated

MSU-ES: 8.26 FTE, $622,923 Total
FWRC: 4.90 FTE, $1,217,065 Total

Wildlife & Fisheries – Youth Development

Performance Goals

1. Help youth develop life skills using shooting sports, wildlife and fisheries management, and hunting and fishing.
2. Recruit youth/adults to natural resource-based vocational/avocational opportunities.

Output Indicators

- Number of 4H Programs (counties involved).
- Number of publications, other educational information.
- Number of adult volunteer leaders/agents trained.
- Number of young people involved.
- Number of events (local and state).

Outcome Indicators

- Number of young people recruited to natural resource activities.
- Number of young people choosing natural resource careers.
- Increased knowledge level by all audiences in shooting sports, and wildlife and fisheries resource disciplines.

Key Program Components

- 4H (through Dept. of Wildlife and Fisheries) Club development based on natural resources/shooting sports.
- Develop curriculum/publications needed.
- Train adult volunteers/agents as leaders/teachers.
- Facilitate network of county-based youth activities.
- Provide events and recognition at state level.

Internal and External Linkages

Multi-State

- National 4H Shooting Sports - all 50 states.
- National Shooting Sports Foundation - all 50 states.
- International Hunter Education Association - all 50 states.

Multi-Institutional

- Conservation Organizations - National Wild Turkey Federation, Ducks Unlimited, National Rifle Association
- Industry companies - Chevron Company.
- Texas Agricultural Extension Service.
- Mississippi Department of Wildlife, Fisheries and Parks.
- US Fish and Wildlife Service.

Multi-Disciplinary

- MSU- Extension Service Agents.
- State 4H Youth Development office.
- MSU Department of Wildlife and Fisheries faculty.

Target Audiences

- Young People aged 8-18 years.
- Families with multi-aged members.
- Volunteer Adult Leaders.
- Teachers.

- Agency Personnel.
- Natural Resource users/nonusers.
- State Publics.

Program Duration

- Intermediate

Education and Outreach Programs

- Field & Stream (Statewide program typically offered at the county and/or multi-county level)
- Youth Sport Fishing (Statewide program typically offered at the county and/or multi-county level)

Wildlife & Fisheries - Socio-Economic Investigations of Fish and Wildlife

Performance Goals

1. Determine environmental attitudes and awareness of people, including Native American communities.
2. Determine economic values and impacts of fish and wildlife resources, non-consumptive and consumptive outdoor recreation, and fee hunting on private lands.
3. Evaluate needs, implementation approaches, and success of environmental awareness and conservation education programs

Output Indicators

- Number of research projects funded and experiments conducted
- Number of publications for general public or agency use
- Number of refereed articles or manuscripts from research projects

Outcome Indicators

- Research results in improved approaches to conservation education and protection of environment.
- Increase information on social and economic values of fish and wildlife resources.
- Development of approaches that encourage sustainable use of natural resources, protection of environmental quality, and environmental awareness.
- Development of information that assist private landowners in production of revenue from non- consumptive and consumptive fish and wildlife recreation.
- Acceptance by funding entities of research findings and recommendation in final reports
- Research findings utilized by private landowners, public land managers, the public, fish and wildlife stakeholders, and policy-makers.
- Implementation of practices that protect environmental quality and support sustainable natural resource use.

Key Program Components

- Enhancing awareness and stewardship of the environment and natural resources
  - Socioeconomic assessment of supplemental stocking of catchable channel catfish
- Economic impact of fish and wildlife recreation in Mississippi, including economic values of gamefish, wild turkey, northern bobwhite, and revenue production from fee-hunting activities on private lands.

Internal and External Linkages

Multi-State

- U.S. Environmental Protection Agency
- USDA Forest Service
- USDA Natural Resource Conservation Service
- USDI National Park Service
- USGS NBS, Mississippi Cooperative Research Unit

Multi-Institutional

- Mississippi Department of Wildlife, Fisheries, and Parks (Natural Heritage Program)

Target Audiences

- The public
- Fish and wildlife stakeholders
- Native American tribal communities
- Private land owners
- Hunting and fishing outfitters and guides
- Governmental policy makers and planners
- Business community
- Educators

Program Duration

- Intermediate (environmental attitudes and awareness; economic values and impacts of fish and wildlife resources)
- Long (environmental awareness and conservation education programs)

Education and Outreach Programs

- Conservation Education Program (Statewide program typically offered at the county and/or multi-county level)

PPA: Youth Development

Issue Statement

4-H is the Cooperative Extension System's dynamic, non-formal, educational program for today's youth. The program combines the cooperative efforts of youth, volunteer leaders, state land-grant universities, federal-state-local governments, and the U.S. Department of Agriculture.

4-H's goal is to create a learning environment for youth that is stimulating to the development of life skills in:

- Competency - developing skills and knowledge
- Coping - dealing with stress
- Contributory - learning to help others

4-H programs are conducted in 82 counties in Mississippi. There are 11,844 youth enrolled in traditional community based clubs, 41,773 enrolled in school enrichment programs, 19,994 in special interest programs, 1,227 in 4-H individual study/family 4-H, 20 in after-school childcare and 59 in overnight camping that were not members of a community 4-H club.

Because 4-H has the potential of reaching such a large number of youth, concentrated efforts are needed to address the lack of skills obtained through other formal and non-formal educational arenas. Research has proven that those young people enrolled in 4-H and participate through either organized clubs, special interest, school enrichment, individual study, and camping programs, are far more likely to have a jump start in acquiring those necessary skills to become productive citizens in their communities than those not involved.

Advisory councils and volunteers have identified priority needs for Extension’s efforts in youth development. Specialists and other youth development leaders have provided research-based information. The needs identified include:

- Leadership
- Citizenship
- Healthy Life-Style Programming
- Entrepreneur/Workforce Preparedness
- Ethics

Resources Allocated

MSU-ES: 24.51 FTE, $1,482,923 Total

Youth Development – 4-H

Performance Goals

1. Youth participants will increase their self-esteem and ability to learn life skills.
2. Adult and youth participants will improve their quality of life through application of subject matter skills gained.
3. Youth participants will improve workforce skills

4. Adults' numbers will increase through volunteer service in quantity and in hours donated to the program.
5. Number of youth participants reached will increase.

Output Indicators

- Number of programs conducted
- Youth involved in 4-H programs in organized clubs
- Youth involved in 4-H programs in school enrichment programs
- Youth enrolled in personal development, leadership, healthy choices and workforce preparedness 4-H projects that focus on life skill development

Outcome Indicators

- Number of youth enrolled and involved in workforce prep programs that focus on life skill development
- Number of youth gaining one critical life skill
- Behavioral change in youth involved in programming (i.e. Increased self-esteem, leadership skills gained and community service projects completed)

Key Program Components

- 4-H Community Club Program
- 4-H School Enrichment Programs
- 4-H Short Term/Special Interest Projects
- Agent Inservice Training
- Teen Leader Programming: conferences and activities
- Volunteer Leader training and forums
- Curriculum including additions and revisions

Internal and External Linkages

Multi-State

- Southern Regional Curriculum Task Force
- 4-H CCS
- Mid-South Fair
- National 4-H Congress
- National 4-H Conference

Multi-Institutional

- 1862/1890 4-H Youth Collaboration Youth Smoking Prevention Program
- Other youth-serving agencies

Target Audiences

- Youth, ages 5-18
- Adults, parents, and volunteer leaders

Program Duration

- Intermediate

Education and Outreach Programs

- 4-H Community Club Program (Statewide program offered at the county level)
- 4-H School Enrichment Programs (Statewide program offered at the county level)

- 4-H Short Term/Special Interest Projects (Statewide program offered at the county level)

PPA: Youth Livestock

Issue Statement

The 4-H youth program is one of the oldest and largest informal educational efforts in the United States. The mission objectives of 4-H youth livestock programs are to assist youth in acquiring knowledge, developing life skills, and forming attitudes that will enable them to become self-directing, productive, and contributing members of society. The skills that the 4-H youth develop are much more than physical skills. In developing these skills, the 4-H youth must utilize a combination of action, critical thinking, and emotion. These skills provide the foundation that enables the 4-H'er to function as an adult in society, accept responsibilities, gain communication skills, make decisions, solve problems, and work with other people.

Youth livestock projects are educational projects that encourage youth to achieve the objectives outlined in the 4-H project. There is probably no other 4-H activity that has more potential for educational and personal development of youth than junior livestock projects and shows.

The junior livestock program is a unique opportunity to utilize live animals as a tool for youth development. The main objectives of the program pertain to the young person, not the animal. Youth gain knowledge about agriculture and livestock production and develop an appreciation for the livestock industry. The primary focus of the youth livestock project is the development of life skills and the encouragement for youth to become productive citizens of our society. The experiences that the youth acquires through owning and working with animals, having the responsibility for their care and development, and exhibiting them in a competitive environment are a tremendous character building process.

Mississippi is mostly a rural state with a large portion of the population being on small farms, home sites of 3-15 acres, or in small towns. This situation is favorable for youth to participate in a 4-H animal project.

During 1998 approximately 7599 youth were enrolled in the 4-H youth animal science projects. There were 1768 enrolled in beef, 657 in dairy cattle, 91 in goats, 2530 in horses & ponies, 549 in sheep, 1981 in swine, and 23 in meat science projects. Supporting the animal projects are related activities/contests that can contribute to the personal growth and development of youth. The activities/contests include the following: judging, visual demonstrations, cookout contests, meats bowl, horse bowl, dairy bowl, horse photography, horse public speaking, and Sale of Junior Champions.

Priority needs for extension's efforts in youth livestock have been developed by discussions with 4-H'ers, volunteers, the Mississippi Livestock Council, the Mississippi 4-H Horse Clubs, Inc. and Sale of Junior Champions Promotion Committee.

The needs identified include the following:

- Communication Skills
- Awareness of 4-H Animal Projects
- Animal Husbandry
- Leadership
- Self-Esteem
- Animal Ethics

Resources Allocated

MSU-ES: 17.29 FTE, $1,041,077 Total

Youth Livestock – 4-H

Performance Goals

1. Increase their practical knowledge of animal husbandry
2. Decrease the incidence of unethical treatment of animals
3. Increase enrollment & participation in 4H animal projects
4. Improve communication skills
5. Develop and demonstrate leadership skills
6. Improve self-esteem

Output Indicators

- Number of in-service training
- Publications
- Number of participants in contest & shows
- Number of training/workshop participants
- Number of publications requested

Outcome Indicators

- Comparison of contest scores from year to year
- Number of incidences of unethical practices with animals
- Number of youth enrolled in animal projects
- Comparison of content & quality of presentations
- Increased participation by senior aged youth assisting younger participants with activities.
- Increase in senior mentoring

Key Program Components

7. Agent In-Service Training
8. Curriculum/Publications
9. Hippology Contest
10. Premier Exhibitor Program (skillathon portion)
11. Horse, Dairy & Meat Bowl Contest
12. Dairy, Horse, Meats & Livestock Judging Contest
13. Livestock & Horse Shows

Internal and External Linkages

Multi-State

14. Regional 4-H Horse Show & Contest
15. National 4-H Dairy, Meats & Livestock Judging Contest
16. Regional 4-H Livestock & Dairy Judging Contest

Multi-Institutional

17. Be a Champ Camp (Mississippi Farm Bureau)

Multi-Disciplinary

18. Livestock, Dairy & Horse Judging Workshops with MAFES

Target Audiences

19. Youth

Program Duration

20. Intermediate

Education and Outreach Programs

21. Hippology Contest (Statewide program)
22. Premier Exhibitor Program (skillathon portion) (Statewide program)
23. Horse, Dairy & Meat Bowl Contest (Statewide program)
24. Dairy, Horse, Meats & Livestock Judging Contest (Statewide program)
25. Livestock & Horse Shows (Statewide program offered at the county level)

Cross-Cutting Research Areas

MAFES invests resources in activities that cannot be tied directly to a certain commodity for one of the following reasons: subject matter studied is at a fundamental stage of investigation and is not yet applied to a specific commodity; the focus of the research investigations is on economic models or social concerns, and is therefore commodity-neutral; or the focus is on engineering systems.

At present, plans are to either create program planning groups for these areas or to give them a more appropriate identity in the current groups.

These cross-cutting areas are:

- Environment and Agricultural Production (MAFES: 6.24 FTE, $1,000,744 Total)
- Biotechnology Sciences in Agriculture (MAFES: 7.45 FTE, $1,799,299 Total)
- Economic and Social Systems (MAFES: 4.97 FTE, $1,023,417 Total)
- Remote Sensing/Precision Agriculture and Engineering Systems (MAFES: 4.90 FTE, $1,340,024 Total)

Stakeholder Input Process

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

County Extension Advisory Councils

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

Overall Extension Advisory Councils

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

Program Advisory Councils

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

Other Stakeholders

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

Research and Extension Center Advisory Councils

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

Forestry and Wildlife Advisory Committees

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

Other Sources of Needs Identification

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

Agriculture and Forestry Summit

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

Key Partners

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

Program Review Process

The program review process includes the merit review of extension programming and the scientific peer review for research projects. Each of these is described below.

Merit Review

Program Delivery Agreements

Each county Extension professional develops a Program Delivery Agreement (PDA) each year. Planning for the PDA is carried out on a yearly basis with the focus of new plans occurring during March and April. PDAs must include a description of the needs assessment process undertaken at the local level to identify needs and issues, outcomes intended, plans of action, evaluation efforts, and general duties. Programs to address underserved or underrepresented clientele are required. PDAs reflect a plan for 65% of a county professional's time, allowing him/her to react to emergency issues that arise during the programming year.

District program directors interact with county professionals to complete PDAs. PDAs are completed electronically on the MSU-ES web server and are maintained throughout the year on the server. After consultation, review, and agreement between agents and DPDs, plans are signed by both parties and "locked in" on the server. This plan is then used for program delivery and as the basis for agent and program evaluation, including measuring outcomes of programs throughout the program year.

In addition, county programs undergo a comprehensive review once every five years. These reviews are conducted on-site by a review team consisting of county staff from other counties, specialists, and administrators. The reviews include interviews with stakeholders from each of the county programs to ensure that clientele needs are being met.

Priority Program Plans

Priority Planning Groups (PPGs), including research and extension faculty, develop priority program plans for the 26 priority program areas. Based on the results of county professionals' PDAs and local needs assessment activity, the PPGs develop a plan including the following components: issue statement, program goals, key program components, target audiences, internal and external linkages, evaluation framework, output measures, outcome measures, and program duration. Priority program plans are reviewed internally by program leaders, department heads, and evaluation and planning specialists.

External Merit Reviews

Experts from outside Mississippi conduct external merit reviews on the priority program plans. Priority program plans are finalized after undergoing the external merit review process. External review teams are asked to use the following outline to guide their review:

FY 2000-04
Plan of Work
Merit Review

Federal Goal and Title:

Goal No.: _____
Title: _____

Program Title: _____

Statement of Issue:
Is the issue clearly stated and defined?
Is the consideration of stakeholder input in the framing of this issue apparent?

Performance Goals:
Are the overall programmatic goals(s) clearly stated?
Are the goal(s) consistent with the Statement of Issue?
Are they consistent with stakeholder input?

Output Indicators:
Do the Output Indicators provide an accounting of the programmatic activities expressed in quantitative and/or qualitative terms?
Are they appropriate for the Statement of Issue and Performance Goals?

Outcome Indicators:
Are the outcome indicators adequate to assess the impact(s) of the program in light of its Statement of Issue and Performance Goals?

Key Components:
Are the Key Components appropriate for the Issue, the target audiences(s), and desired outputs and outcome?
Do they reflect both Multi-State and integrated activities as appropriate?

Internal and External Linkages:
Are Multi-State and integrated components accounted for?
Given the scope of this program, should other internal and external linkages be considered? If so, please identify.

Program Duration:
Is the proposed duration appropriate for the nature of the issue, the goals(s), and objectives of the program?

General Comments:

Recommendation:

Scientific Peer Review

These procedures were instituted in 1980 and are applied to every scientific publication and all research proposals except those submitted externally to competitive programs. This policy follows the May 11, 1999 draft "National Operational Guidelines and Performance Standards for State Agricultural Experiment Stations" developed by Dave McKenzie, Executive Director, NE Region for ESCOP consideration.

Definition of peer review: evaluation of conceptual and technical soundness of the intended activity by individuals qualified by their status in the same or a related discipline.

Documents Reviewed

- CRIS project plans
- Manuscripts for scientific journal publication
- MAFES Technical Bulletins
- FWRC Research Advances
- MAFES Information Sheets
- Federal Special Grant proposals and annual progress reports

Documents Not Reviewed

Projects that require peer review as part of the evaluation process (e.g., competitively awarded grants, federal contract research projects, and federal cooperative agreements)

Reviewers

Three scientific peer reviewers who are not collaborating on the research project, preferably from outside the university. Members of a departmental advisory committee review some FWRC publications.

Approval

Peer reviews are collated in the FWRC or MAFES Director's office and examined for adequacy before permission to publish or submission to the appropriate agency is granted.

Multistate Research and Extension Activities

Hatch Multistate Research

MAFES allocates $834,005 each year for the following multistate research projects.

S-009	Plant Genetic Resource Conservation and Utilization
S-065	Regional Research Coordination, Southern Region
S-183	Phenology, Population Dynamics and Interference: A Basis for Understanding Weed Biology and Ecology
S-222	Fruit and Vegetable Supply-Chain Management, Innovations, and Competitiveness
S-259	Rural Labor Markets in the Global Economy
S-260	Biology, Ecology and Management of Riceland Mosquito Populations
S-262	Diversity and Interactions of Beneficial Bacteria and Fungi in the Rhizosphere
S-263	Enhancing Food Safety Through Control of Foodborne Disease Agents
S-265	Development and Integration of Entomopathogens into Pest Management Systems
S-266	Parameter Sensing and Control Systems for Drying Agricultural Commodities
S-268	Evaluation and Development of Plant Pathogens for Biological Control of Weeds
S-269	Biological Control and Management of Soilborne Plant Pathogens for Sustainable Crop Production
S-270	Utilizing Potassium Buffering Capacity to Predict Cotton Yield Response to Potassium Fertilizer
S-271	Solid-Phase Extraction Techniques for Pesticides in Water Samples
S-272	Development of Textile Materials for Environmental Compatibility and Human Health and Safety
S-277	Breeding to Optimize Maternal Performance and Reproduction of Beef Cows in the Southern Region
S-280	Mineralogical Controls on Colloid Dispersion and Solid-Phase Speciation of Soil Contaminants
S-281	Dynamic Soybean Insect Management for Emerging Agricultural Technologies and Variable Environments
S-282	Managing Plant-Parasitic Nematodes in Sustainable Agriculture with Emphasis on Crop Resistance
S-283	Develop and Assess Precision Farming Technology and Its Economic and Environmental Impacts
S-286	Herbicide Persistence in Southern Soils: Bioavailable Concentration and Effect on Sensitive Rotational Crops
S-287	Impacts of Trade agreements and Economic Policies on Southern Agriculture
S-288	Nutritional Systems for Swine to Increase Reproductive Efficiency
NC-007	Plant Germplasm and Information Management and Utilization
NC-107	Bovine Respiratory Diseases: Risk Factors, Pathogens, Diagnosis, and Management
NC-222	Impact of Technology on Consumer Access to Food and Fiber Products
W-130	Freeze Damage and Protection of Fruit and Nut Crops
W-173	Stress Factors of Farm Animals and Their Effects on Performance
W-187	Interactions Among Bark Beetles, Pathogens, and Conifers in American Forests

Smith-Lever Multistate Extension

Programs considered true multistate Extension programs have (or will have) joint planning, specified performance goals, specified outcomes, evaluation procedures, and a completed memorandum of agreement between cooperating states.

Current Projects

Dairy & Beef Program (Franklinton Project)
Purpose: Improve production management practices and forage quality in cow/calf and dairy operations.
Cooperating State(s): Louisiana

Southern Region Aquaculture Center
Purpose: Increase aquaculture production and efficiency.
Cooperating State(s): Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, Virgin Islands, Virginia

Planned Projects

At present, none of the following projects have met the requirements: planned jointly; specified goals, outcomes, and evaluation procedures; and a written agreement.

Limited-Resource Management Program Planning Group
Purpose: Improve family financial management skills among limited resource (working poor) families.
Cooperating State(s): Arkansas, Louisiana

Mid-South Fair Youth Committee
Purpose: Improvement of life skills and decision making of youth.
Cooperating State(s): Arkansas, Tennessee

Pesticide Applicator Training
Purpose: Provide for safe use of pesticides by all commercial and private pesticide applicators and other interested clientele.
Cooperating State(s): Arkansas, Louisiana

Distance Plant Disease Diagnosis
Purpose: Provide for efficient and timely diagnosis of plant diseases using digital cameras and computer imaging.
Cooperating State(s): Arkansas, Louisiana

Master Naturalist Curriculum Project
Purpose: Increase knowledge of youth and adults concerning the environmental components making up the natural landscape of the Southern states.
Cooperating State(s): TBA

DHIA (Dairy Records) Program

Purpose: Increase producer management capabilities by expanding existing statewide dairy herd improvement programs, including sharing information between Mississippi and Louisiana.
Cooperating State(s): Louisiana

Bull Evaluation Project
Purpose: Improve herd quality through evaluation of on-forage bulls by expanding Mississippi project to include producers from Louisiana.
Cooperating State(s): Louisiana

Cow/Calf Management Project
Purpose: Improve management of cow/calf operations in West-Central Alabama and East Central Mississippi using integrated resource management.
Cooperating State(s): Alabama

Southern Regional Volunteer Leader Forum
Purpose: Improve leadership skills of 4-H/Youth volunteers.
Cooperating State(s): Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, Virgin Islands, Virginia

Southern Regional Curriculum Task Force
Purpose: Design, pilot test, evaluate, and distribute curriculum for 4-H/Youth.
Cooperating State(s): Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, Virgin Islands, Virginia

4-H CCS (Curriculum Consortium System)
Purpose: Design, pilot test, evaluate, and distribute curriculum for 4-H/Youth, provide inservice training on the curriculum for agents.
Cooperating State(s): national participation

National 4-H Congress
Purpose: Improvement of life skills and decision making of youth.
Cooperating State(s): national participation

National 4-H Conference
Purpose: Improvement of life skills and decision making of youth.
Cooperating State(s): national participation

Tri-State Ministers Program
Purpose: Improvement of ministering and leadership skills of ministers.
Cooperating State(s): TN

National Network for Health
Purpose: Facilitate the collection, development, access and delivery of health related information and educational materials among the Land Grant Universities and the general public.
Cooperating State(s): national participation

Integrated Research and Extension Activities

This Plan of Work addresses issues using integrated teams that represent the aforementioned priority program areas. These teams are composed of research and extension personnel and include an integrated approach to identifying needs, conducting research and providing programming to meet those needs, and evaluating outcomes. The planned programs presented here are all integrated research and extension programs.

MSU-ES spends $9,479,077, or 29.5% of its total budget, on integrated work in the 26 priority program areas. MAFES spends $33,757,616, or 73.07% of its total budget, on work in these areas.

Southern Extension/Research Activities (SERA)

In addition to addressing the statewide issues described in this Plan of Work, extension and research professionals are involved in integrated Information Exchange Groups (IEG) and Task Forces (TF) within the Southern Region. SERA IEG and TF goals are described below.

SERA-IEG-1: Southern Region Pesticide Impact Assessment Program

To provide a forum for research and extension scientists to identify and exchange information and data needs for pesticides, undergoing regulatory review, that are used in the management of pests in agricultural production in the Southern Region.

SERA-IEG-2: Assuring Food Safety through Control of Food Borne Disease Agents

1. To provide a means of exchanging information and ideas on food safety issues in the Southern Region.
2. By exchanging information and ideas, to identify and avoid areas of unnecessary duplication in both research and Extension programs.
3. To facilitate communication with agencies interested in food safety such as the Food Safety and Inspection Service of USDA, the Agricultural Research Service of USDA, and the Communicable Diseases Center of DHHS.
4. To identify opportunities for areas of new collaboration among the states and collaborating agencies in research and Extension activities in food safety.

SERA-IEG-3: Integrated Pest Management

To bring together, on an annual basis, research scientists and extension specialists from a diversity of disciplinary backgrounds who share a common interest in integrated pest management:

1. To exchange current information on the status of new research findings and extension programs.
2. To provide a forum for reporting findings from projects funded from IPM grants.
3. To provide recommendations on the coordination and operation of the Southern Region IPM Grants Program.

SERA-IEG-4: Mechanization and Post-Harvest Technology of Fruits and Vegetables

1. Provide a forum for exchanging research results, field experiences and observations, and other information relating to common problems facing Southern Regional Extension specialists, engineers, and scientists having responsibilities in horticultural mechanization and post-harvest technology of fruits and vegetables.
2. Foster the development of linkages with, and stimulate ideas among, persons representing various industries and academic disciplines and who have related common interests.
3. Enable the Associations of Southern Experiment Station and Extension Directors to coordinate the diverse efforts of their personnel involved in production and post-harvest technology pursuits.

SERA-IEG-5: Sweet Potato Collaborators Conference

To meet in annual session to present and discuss the latest research on genetics and variety development, production and cultural practices, economics and marketing, and product development.

SERA-IEG-6: Nutrient Analysis of Soils, Plants, Water, and Waste Materials

1. To develop, modify, and document reference laboratory procedures for nutrient analysis labs in the Southern Region.
2. To "regionalize" soil calibration/correlation and interpretation efforts among states that share similar soils and climate.
3. To encourage analytical proficiency and adequate quality control/quality assurance among member laboratories.

SERA-IEG-7: Biology and Management of Peanut Insects and Other Arthropods

1. Investigate the biology and ecology of insect pests of peanuts, and develop effective management strategies for these peanuts.
2. Examine alternative methods of peanut insect control, such as the use of biological control organisms, diseases, host plant resistance and cultural tactics.
3. Develop, refine and validate predictive systems for anticipating pest outbreaks.

SERA-IEG-8: Fescue Endophyte Research and Extension

1. To exchange research information, techniques, and ideas.
2. To exchange technology transfer information and to develop management programs appropriate for utilization of endophyte-infected grasses under different applications.

SERA-IEG-9: Aquatic Food Animals from Warm Water Aquaculture

1. To bring together on an annual basis, research scientists and extension specialists from a diversity of disciplinary backgrounds who share a common interest in warmwater aquaculture.
2. To exchange current information on the status of new research findings.

3. To gain a regional perspective to current relevant problems.
4. To consider joint activities that might be proposed.

SERA-IEG-10: Housing in the Rural South

To bring together housing researchers and extension personnel to:

1. Present housing research and Extension interests and capabilities of institutions in the region.
2. Discuss current and future housing problems and needs that can be effectively addressed through regional research and Extension efforts.
3. Identify current national research and Extension priorities related to housing.
4. Meet with housing industry professionals and agencies to explore opportunities for interactions.

SERA-IEG-11: Coordination of Oilseed Rape/Canola Programs in the Southern Region

1. Exchange information on research and extension programs on oilseed rape/canola in the southern region.
2. Determine critical research needs, coordinate research activities and identify areas where cooperative efforts would enhance oilseed rape/canola research programs.
3. Expedite the transfer of information to agribusiness clientele and farmers.

SERA-IEG-12: Southern Forest Insect Work Conference

1. Advance the science of forest entomology.
2. Provide a medium for the exchange of professional thoughts.
3. Provide a clearing house for technical information.
4. Gain a regional perspective on forest insect problems.
5. Develop educational program support materials for the region.

SERA-IEG-14: Development and Evaluation of Bunch and Muscadine Grapes for Fresh Market, Juice, Wine, and Other Products

1. To breed, develop, and evaluate Vitis genotypes and selections over a wide range of environments encountered throughout the Southern Region and to develop cultural practices directed towards the commercialization of viticulture in the Southeastern United States.
2. To develop and evaluate Vitis species for fresh market produce along with processed products such as juice, jelly, wine, etc.
3. To exchange information with scientists working on Vitis species and make the information available to growers throughout the Southeastern United States.

SERA-IEG-15: Competitiveness and Sustainability of the Southern Dairy Industry

1. Bring together researchers and extension specialists and agents who have a common concern for the competitiveness and sustainability of the Southern Dairy Industry.
2. Exchange existing information and identify gaps in information.

3. Coordinate efforts to identify researchable issues affecting the Southern dairy industry and select appropriate research methodologies.
4. Disseminate information to industry participants and policy makers.
5. Provide a forum for Southern dairy industry representatives and agency and organization personnel to give feedback to research and extension personnel in setting research and outreach priorities.

SERA-IEG-16: Rural Infrastructure as a Cause and Consequence of Rural Economic Development and Quality of Life

1. To bring together researchers and extension specialists with an interest in rural infrastructure issues.
2. Exchange existing information, identify on-going research and extension programs relating to infrastructure and economic development, and identify research and extension needs and discuss methodologies and procedures for addressing these needs.
3. Disseminate information to researchers, extension specialists, and clientele groups.

SERA-IEG-17: Minimizing Agricultural Phosphorus Runoff Losses for Protection of the Water Resource

The overall objective is to develop BMPs for minimizing P loss from agricultural activities, with special emphasis on animal waste. While research will be an important component of this project, the establishment of an information exchange between applied researchers, state extension specialists, industry representatives, and representatives from state and federal agencies is fundamental to the accomplishment of the overall objective and will be stressed.

Throughout the process, input will be sought from other specialists such as limnologists, lake and watershed managers, and regulatory personnel. In this forum, the following sub-objectives will be accomplished:

1. Develop a method of identifying P sensitive water resources.
2. Develop BMPs that limit P in the runoff.
3. Develop a manure application strategy based on P and N.
4. Identify cut off levels of soil test P for benchmark soils.
5. Develop a field level P indexing procedure for assessing individual fields as to their potential for P loss.

SERA-IEG-18: Rice Technical Work Group

Exchange scientific information about rice production.

SERA-IEG-19: The Changing Rural Health System: Education for Consumers and Providers

1. Exchange current information on the status of new research findings and extension programs related to rural health and safety issues.
2. Gain regional perspective on current rural health problems.
3. Consider joint activities that might be proposed as a result of exchanges.

SERA-IEG-20: Southern Conservation Tillage Conference for Sustainable Agriculture

The primary mission of the SCTSCA is to provide a medium for exchanging information about conservation tillage and related technology between and among researchers, extension personnel, NRCS personnel, crop consultants, agrochemical companies and farmers. The primary goal of most conservation tillage research is to develop improved technology to increase yields and/or profitability of agricultural crops and livestock while maintaining or improving the quality of soil and water resources available for agricultural, domestic and recreational uses. The overall objective of the SCTCSA is to expand the conservation tillage systems in the South for the purpose of controlling erosion and reducing environmental degradation.

SERA-IEG-21: Use of Forage-Animal Models in Resource Management

1. Provide a mechanism for researchers and extension personnel to expand the use of computer models in decision support systems for integrated resource management.
2. Seek ways to transfer technology associated with the GRAZE model to regulatory agency personnel, policy makers, commodity representatives and grazing land managers.
3. Continue to evaluate and improve the GRAZE model through field and laboratory experiments and enhancement of its fundamental logic through feedback from expanded communications.

SERA-IEG-23: Cotton Insects

1. To provide a forum for discussing successes and failures in the boll weevil eradication program as it expands over the weevil's range in the U.S.
2. To provide a forum for discussing and planning research and extension activities critical to successfully implementing and achieving eradication of the boll weevil in the remaining infested states.
3. To provide a forum for discussing other arthropod pest problems on cotton that must be managed to insure economically successful production of the crop.

SERA-IEG-24: Composting and Compost Utilization

1. Development of standardized tests for measuring the chemical, physical, and biological properties of finished compost and identifying the best use for composts with different properties.
2. Development of standardized tests for monitoring the chemical, physical, and biological properties of organic materials during the composting process so that the compost can be produced uniformly and rapidly.
3. Development of standardized tests to predict the properties of finished compost based on various organic input materials to the process.
4. Develop an understanding of the chemical, physical, and biological properties of finished composts suitable for various end users.
5. Develop economic models to identify the best organic inputs for composting and potential barriers to adoption by compost producers and targeted end users.
6. Prepare educational materials in the form of publication, slides, movies, etc., that are suitable for the composting materials produced in the Southern Region and make these available to targeted audiences.

7. Train extension field faculty and other professionals to understand and deliver the research findings and standards.

SERA-IEG-25: Turf

1. Foster exchange of information on current research direction, future research directions, and current research results.
2. Encourage exchange of information on research methodologies/techniques.
3. Promote interchange of extension and instructional programs, methods, and directions.

SERA-IEG-26: Fire Ants

1. Provide a forum for all persons interested in imported fire ants (IFA) to present their findings and exchange ideas.
2. Facilitate planning and coordination of research and extension projects/programs.
3. Provide scientists and specialists a convenient means for communicating results of their efforts through publication of an annual proceedings.

SERA-IEG-27: Nursery Crop and Landscape Systems

1. Identify, evaluate, select, and disseminate information on superior environmentally sustainable landscape plants in nursery crop production and landscape systems in the Southeast.
2. Collectively and individually disseminate information gained from the plant evaluation system such as cold hardiness, heat tolerance, growth rate, environmental adaption limits, etc. to a wide variety of audiences.

SERA-IEG-28: Image Enhancement

Enhance the awareness of political, business, and social leaders of clientele groups, and society in general concerning the importance of agriculture in terms of social, economic, environmental, health, etc. benefits.

SERA-IEG-29: Black Fly Biology, Economic Problems, and Management

Provide a vehicle for the interactive exchange and facilitation of scientific expertise on the following topics:

1. identification and genetic structure of economically important black fly species;
2. relations of larval and adult black flies with their biotic and abiotic environment;
3. economic impacts of black flies and development of biocontrol agents; and
4. black flies as bioindicators of flowing-water health.

SERA-IEG-30: Southern Natural Resource Economics Committee

1. Bring together natural resource economists involved in research, extension, and teaching.
2. Exchange existing information, identify ongoing research and extension programs in natural resource economics, identify research and extension needs, and discuss approaches for addressing those needs.

3. Provide information from annual programs to interested parties through publication of program proceedings, where appropriate.

SERA-IEG-31: Economics and Management of Risk in Agriculture and Natural Resources

The SERA-IEG will provide a scientific/professional forum to facilitate the exchange of theoretical and methodological approaches to risk analysis, and to nurture the development of original concepts and preliminary research efforts related to agriculture and natural resources. Specific focus issues will include:

1. Micro-level modeling of natural resource and environmental risk issues, including ground- and surface-water pollution, and increased emphasis on agricultural sustainability, and increased conflicts in resource demands between agricultural and competing users.
2. Firm-level risk management modeling, including the production, financial, marketing and environmental impacts and risks associated with new technology and the potential benefits resulting from improved access to information.
3. Economic theory and the behavioral foundations of decision making under uncertainty, in risk assessment, asymmetric risk attitudes, and state-dependent utility.
4. The impact of public policy on the risk environment of individuals, firms, and sectors within exogenous trade shocks, food safety regulations, changes in financial and farm insurance institutions, and resource pricing policies.
5. Opportunities are expected to arise for spin-offs of the SERA-IEG into regional research project proposals, as well as collaborative efforts in attaining extramural grants and contracts related to risk analysis.

SERA-TF-11: Utilization of University-Based Food Processing Centers

1. Improve quality of value-added processing.
2. Involve university-based food processing center specialists and develop guidelines.
3. Extend shelf life and help assure safety of foods.