

July 14, 1999

Dr. George Cooper
Deputy Administrator
USDA-CSREES
Partners-POW
1400 Independence Avenue S.W.
Stop 2214
Washington, D.C. 20250-2214

Dear Dr. Cooper:

I am pleased to enclose the Plans of Work for the Arkansas Agricultural Experiment Station (AES) and the Cooperative Extension Service (CES) of the University of Arkansas Division of Agriculture for Federal Fiscal years 2000 -2004. This year, given the new nature of the process and the time constraints involved, we have elected to submit these as separate plans to simplify our reporting process under current data management systems and to better reflect the focus areas of the respective units. However, the two plans were developed jointly by AES and CES with the expectation that we will submit a single, fully integrated plan in the future.

Also, we have worked closely with Dr. Jackie McCray, Dean/Director of 1890 Research and Extension at the University of Arkansas at Pine Bluff and her staff in developing both the research and extension plans. Dr. McCray will be submitting the 1890 research and extension plans under separate cover. Again, our desire is to submit a single Arkansas plan in the future incorporating all parts of the research and extension programs.

Within the Division of Agriculture we seek to integrate our research and extension programs using joint appointments of faculty, joint administrative positions, joint planning and program review activities and, clearly, combined stakeholder inputs. One group of stakeholders not mentioned in either of the plans is the Agricultural Development Council which serves as an oversight body for Division programs encompassing all aspects of our activities .

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Letter to Dr. George Cooper

Our expectation is to refine both our definition and documentation of multi -state research and extension programs in future submissions. We have documented our Regional Research Projects in the AES submission and will submit a definitive CES documentation as we come to closure with other states on the appropriate programs to include.

As with all states, this is a new venture and process. We look forward to your comments and recommendations for our plans.

Sincerely,

A black rectangular box containing a white handwritten signature that reads "Milo J. Shult".

Milo J. Shult

Vice President for Agriculture

cc: Dr. David Foster

Dr. J. W. McCray

Dr. Charles J. Scifres

PLAN OF WORK

**University of Arkansas
Division of Agriculture
COOPERATIVE EXTENSION SERVICE**

**Federal Fiscal Years
2000-2004**

**University of Arkansas, Division of Agriculture,
COOPERATIVE EXTENSION SERVICE
PLAN OF WORK**

Introduction

The Cooperative Extension Service (CES) is a part of the University of Arkansas Division of Agriculture which includes the Arkansas Agricultural Experiment Station (AAES). This plan of work is a comprehensive program plan of Extension activities for FY 2000-2004. Although the Extension Service and the Experiment Station are fully integrated within the Division, separate plans have been developed but submitted jointly.

Program plans have been divided into 21 program areas under the five national goals. Several program areas have been subdivided for ease of reporting.

The Allocated Resources section in all program components are based on FY 99 budget figures and are separated into total FTE costs and Federal 3b and c budget share followed by the Integrated Activities estimate.

Point of Contact

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Cooperative Extension Service Program Areas

GOAL 1. An agricultural system that is highly competitive in the global economy

- Program Area 1.** Agronomic Crops Production and Management
- Program Area 2.** Livestock and Forage Production and Management
- Program Area 3.** Poultry Production and Management
- Program Area 4.** Forest Management
- Program Area 5.** Horticulture Production and Management
- Program Area 6.** Alternative Agricultural Enterprises
- Program Area 7.** Agricultural Marketing, Management and Farm Policy

GOAL 2. A safe and secure food and fiber system

- Program Area 8.** Safe Food - From Farm to Table

GOAL 3. A healthy, well-nourished population

- Program Area 9.** Improving Health

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

- Program Area 10.** Maintaining Agricultural Sustainability Through Conservation of Natural Resources and Protection of the Environment

Program Area 11. Animal Waste Management

Program Area 12. Cotton Pest Management/Integrated Pest Management

Program Area 13. Pesticide Applicator Training

GOAL 5. Enhanced economic opportunity and quality of life for Americans

Program Area 14. Imported Fire Ant Education Program

Program Area 15. Solid Waste Management

Program Area 16. Economic and Community Development and Public Policy Education

Program Area 17. Leadership and Volunteer Development

Program Area 18. Strengthening Families

Program Area 19. Managing Resources

Program Area 20. Developing Youth

Program Area 21. Managing Resources in Limited Resource Families (Louisiana, Mississippi, and Arkansas)

Stakeholder Input Process

Program Review Process

Multi-State Extension Activities

Integrated Research and Extension Activities

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

Agronomic Crops Production and Management

Statement of Issues

- In Arkansas, the annual cash receipts from row crop agriculture exceed \$2 billion annually with a total economic impact of around \$3.4 billion.
- Arkansas cotton production annually generates farm gate income in excess of \$600 million from around 900,000 acres involving approximately 1700 producers. This industry ranks in the top five nationally.
- Arkansas rice production annually generates farm gate income in excess of \$750 million from around 1.4 million acres involving approximately 4,200 producers. This industry ranks number 1 nationally and represents 45% of the nation's rice production.
- Arkansas soybean production annually generates farm gate income in excess of \$700 million from around 3.5 million acres involving approximately 7,000 producers. This industry ranks in the top 10 nationally.
- Arkansas wheat production annually generates farm gate income in excess of \$200,000 million annually from around 1.0 million acres involving approximately 3,500 producers. This industry ranks in the top 20 nationally.
- Arkansas corn and sorghum production annually generates farm gate income in excess of \$80 million annually from around 220,000 acres involving approximately 1,700 producers. This industry ranks in the top 30 nationally in corn production and in the top 10 in sorghum production.
- Using a discussion and priority setting process, the County Extension Councils in three - fourths of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate clientele on how to increase efficiency of production while maintaining flexibility in becoming more competitive in the globaleconomy.

Output Indicators - Cotton

- Number of producers attending educational programs (including Extension -related industry meetings), field days, etc. and receiving educational materials.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientele on variety selection for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientel e on fertilizer and soil and water management for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientele on cultural and integrated pest management (including COTMAN) practices for increased yields and reduced production expenses.
- Educational materials produced.

Output Indicators - Rice

- Number of producers attending educational programs (including Extension -related industry meetings), field days, etc. and receiving educational materials.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientele on variety selection for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientel e on fertilizer and soil and water management for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientele on cultural and integrated pest management practices for increased yields and reduced production expenses.
- Educational materials produced.

Output Indicators - Soybeans

- Number of producers attending educational programs (including Extension -related industry meetings), field days, etc. and receiving educational materials.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientele on variety selection for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on- farm research, farm visits and/or field days for clientel e on fertilizer and soil and

water management for increased yields and reduced production expenses.

- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on cultural and integrated pest management (including reduced-rate weed control technology) practices for increased yields and reduced production expenses.
- Educational materials produced.

Output Indicators - Wheat

- Number of producers attending educational programs (including Extension -related industry meetings), field days, etc. and receiving educational materials.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on variety selection and drainage for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on fertilizer management for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on cultural and integrated pest management practices for increased yields and reduced production expenses.
- Educational materials produced.

Output Indicators - Corn and Sorghum

- Number of producers attending educational programs (including Extension -related industry meetings), field days, etc. and receiving educational materials.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on variety selection for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on fertilizer and soil and water management for increased yields and reduced production expenses.
- Educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on cultural and integrated pest management practices for increased yields and reduced production expenses.
- Educational materials produced.

Outcome Indicators - Cotton

- Number of clientele who select improved varieties.
- Number of clientele (and impacted acres) using soil and plant testing and irrigation scheduling programs.
- Number of participants who utilize integrated pest management programs and the COTMAN plant monitoring program.
- Number of clientele who change production and/or tillage practices.

Outcome Indicators - Rice

- Number of clientele who select improved varieties.
- Number of clientele (and impacted acres) using soil, plant and water testing.
- Number of participants who utilize integrated pest management programs.
- Number of clientele (and impacted acres) who utilize the DD 50 program for improved production efficiency.

Outcome Indicators - Soybeans

- Number of clientele who select improved varieties.
- Number of clientele (and impacted acres) using soil testing and irrigation scheduling programs.
- Number of participants who utilize integrated pest management programs and the reduced rate weed control technology.
- Number of clientele who change production and/or tillage practices.

Outcome Indicators - Wheat

- Number of clientele who select improved varieties and implement improved drainage systems.
- Number of clientele (and impacted acres) using soil and plant testing programs.
- Number of participants who utilize integrated pest management programs.
- Number of clientele who change production and/or tillage practices or implement improved drainage systems.

Outcome Indicators - Corn and Sorghum

- Number of clientele who select improved hybrids
- Number of clientele (and impacted acres) using soil and plant testing and irrigation scheduling programs.
- Number of participants who utilize integrated pest management programs.
- Number of clientele who change production and/or tillage practices.

Key Components

Agronomic production education may include but not limited to variety selection, soil and water testing, irrigation scheduling, Integrated Pest Management, plant monitoring and nutrition and informal surveys of participants to measure practice changes.

Internal and External Linkages

Internal:

Extension Service and Agricultural Experiment Station faculty of the respective cooperating institutions

External:

- Commodity/Producer Groups
- Arkansas Farm Bureau
- Professional Organizations
- Other Federal and State Agencies
- Agricultural Council of Arkansas

Target Audiences

- Growers
- Agribusiness
- Consultants
- Other interested individuals

Program Duration

Long Term

Allocated Resources

FY1999 Total: 47 FTE, \$4,376,814; Federal (3b&c) – \$667,283
Integrated – \$473,869; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

Cotton

Primary education programs related to cotton production include the COTMAN computer program, Cotton Research Verification Program (CRVP), Cotton Nutrient Monitoring, Extension Cotton Scouting Program, Community - Wide Insect Management and other related Integrated Pest Management programs. The CRVP is a tool to encourage grower adoption of the demonstrated technology, as well as serving as intensive in - service training for agents. The COTMAN program, with emphasis on end -of- the season management, is being used and/or

demonstrated by county Extension agents in much of the major cotton growing counties. On -farm demonstrations and replicated large-plot research conducted in cooperation with county Extension agents are also a part of the county cotton educational program.

Rice

The primary educational programs implemented in Arkansas include the DD50 computerized management program, Rice Research Verification Program (RRVP), and on -farm demonstration and replicated research trials in cooperation with county Extension agents. The DD50 program is used by over 2,000 growers on approximately 60 percent of the states rice acreage to help time management practices during the season. The RRVP has been conducted on more than 150 commercial rice fields since 1983 to assist in transfer of technology from research to grower use. The RRVP also assists in establishing applied demonstration and replicated research trials in commercial rice fields to either collect data on farm specific problems or demonstrate and refine production recommendations.

Soybeans

The primary educational programs implemented in Arkansas include “SOYVA”, Arkansas’ variety selection program, Soybean Research Verification Program (SRVP), and on -farm demonstration and replicated research trials in cooperation with county Extension agents. The SOYVA program is used extensively by growers and seed dealers statewide. The SRVP has been conducted on more than 250 commercial soybean fields since 1983 to assist in transfer of technology from research to grower use. The SRVP also assists in establishing applied demonstration and replicated research trials in commercial soybean fields to either collect data on farm specific problems or demonstrate and refine production recommendations. Additionally, the SRVP and the Applied Soybean Research Program have enabled the University of Arkansas Cooperative Extension Service to be involved in “Site Specific” or “Precision Agriculture” soybean production statewide.

Wheat

The primary educational programs implemented in Arkansas include the Wheat Research Verification Program (WRVP), and on -farm demonstration and replicated research trials in cooperation with county Extension agents. The WRVP has been conducted on more than 129 wheat fields since 1986 to assist in transfer of technology from research to grower use. The WRVP also assists in establishing applied demonstration and replicated research trials in commercial wheat fields to either collect data on farm specific problems or demonstrate and refine production recommendations.

Livestock and Forage Production and Management

Statement of Issue

- More than 30,000 farms in Arkansas produce beef cattle. About 97 percent of the beef farms are family owned and operated. Arkansas has approximately 1.77 million head of cattle with a total economic impact of over \$2 billion. Improving beef cattle production efficiency and thus improving profitability is the major issue facing most beef producers.
- The Arkansas dairy industry is a \$115-\$120 million industry with a total economic impact of \$700 million. Dairy producers' major concerns are to identify improvements to enhance production efficiency.
- Arkansas climate and most of its soil and terrain are suited for the production of grass and other forage necessary for livestock production. There are 2 million acres of bermudagrass, fescue and native mixed grasses (total 6 million acres) managed to enhance livestock production and environmental stewardship.
- Arkansas has approximately 160,000 to 180,000 horses with over 60,000 households having a horse. A combination of horse maintenance costs and capital investment make this a \$3.5 billion industry. Recreation is the number one reason for horse ownership.
- Using a discussion and priority setting process, the County Extension Councils in 90 percent of Arkansas counties have identified these issues as a major emphasis for their long range education program.

Performance Goal

To educate clientele on how to increase efficiency of production while maintaining flexibility in a more competitive in the global economy.

Output Indicators - Beef

- Number of producers attending educational programs (including Extension-related industry meetings), field days, etc. and receiving educational materials
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on beef cattle nutrition
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on forage production and grazing management
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on selection and genetics
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on animal health and Beef Quality Assurance
 - Educational materials produced

Output Indicators - Dairy

- Number of producers attending educational programs (including Extension-related industry meetings), field days, etc. and receiving educational materials
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on management records, nutrition, reproduction and health
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on forage production and grazing management
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on manure management and cow comfort
- Educational materials produced

Output Indicators - Horse

- Number of producers attending educational programs (including Extension-related industry meetings), field days, etc. and receiving educational materials
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on general horsemanship and equitation
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse nutrition
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on pasture management and hay quality
 - Educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse health
- Educational materials produced

Outcome Indicators - Beef

- Number of participants who changed their animal nutrition management practices
- Number of participants who changed their forage and grazing management production practices
- Number of participants who changed their genetics and selection practices
- Number of participants who changed their animal health management practices

Outcome Indicators - Dairy

- Number of participants who changed their management practices to improve records and production techniques
- Number of participants who changed their forage and grazing management production practices
- Number of participants who changed their manure management and cow comfort records

Outcome Indicators - Horse

- Number of participants who improved their equitation and horsemanship skills
- Number of participants who changed their horse nutrition management practices
- Number of participants who changed their horse grazing management practices and improved hay quality
- Number of participants who changed their horse health management practices

Key Components

Livestock and forage production education may include but not be limited to forage testing, body condition scoring, balanced rations, cow herd performance, soil testing, EPD's, rotational grazing, injection locations, minerals and vitamins, grass species, livestock handling and safety, survey (informal), etc.

Internal and External Linkages

Internal:

Extension Service and Agricultural Experiment Station faculty of the respective cooperating institutions.

External:

- Livestock and Poultry Commission
- Arkansas Cattlemen's Association
- NRCS and Arkansas Soil and Water Conservation Commission
- Professional organizations
- Other federal and state agencies
- Arkansas Farm Bureau
- Arkansas dairy organizations
- Arkansas Forage and Grassland Council
- Arkansas Horse Council
- Arkansas State Horse Show Association
- Arkansas Quarter Horse Association and other breed associations

Target Audiences

- Full-time Producers
- Part-time Producers
- Agribusiness
- Consultants
- Other interested individuals

Program Duration

Long term: Greater than or equal to 5 years

Allocated Resources

- Total: 31.65 FTE, \$2,946,112; Federal (3b&c) – \$449,160
- Integrated - \$268,335; Projected Resources for FY2000-2004 are 2% annual increases.

Education and Outreach Programs

- Arkansas Beef Improvement Program - involves producers to demonstrate cost effective management practices using an integrated resource management team approach.
- Arkansas Beef Quality Assurance Program - centers around cow-calf management practices that affect the overall value and quality of the cattle product.
- Bull Evaluation Breeding Program - demonstrates the importance of conducting bull breeding soundness evaluations for cow-calf producers.
- Cattle Performance Testing Programs - involves the collection of performance data from the cow herd and from potential bulls to enhance cattle quality.
- Arkansas Steer Feedout Program - provides an opportunity for cow-calf producers to learn more about the cattle they produce and to determine if the cattle fit industry's needs.
- Dairy Educational Programs - to help dairy producers identify areas needing improvement to enhance production efficiency.
- Horsemen's Short Course - a three part yearly program customized for clientele interest related to horse production.
- Arkansas Grazing Management Schools - to teach livestock producers skills and information needed for profitable grazing management.
- Arkansas Hay Day - a state wide program to demonstrate the importance of producing high quality hay.
- Cattlemen's College - a joint program with the Arkansas Cattlemen's Association to bring the latest information to Arkansas producers.

Poultry Production and Management

Statement of Issue

On a nationwide basis Arkansas ranks 2nd in broiler production, 3rd in turkey production and 8th in egg production. Although the Arkansas poultry industry provided an estimated 5,000 poultry farm families with nearly \$2.6 billion in farm income, informal discussions with management personnel from integrated poultry companies, contract growers, allied industry personnel, government officials and extension professionals have revealed that the industry is likely to face numerous challenges in the coming decade. These challenges include: increased global competition which demands peak productive efficiency, compliance with environmental regulations, implementation of new poultry processing regulations, and new disease challenges. Effective solutions will depend on the implementation of the latest scientific information by poultry company personnel and the adoption of the latest production techniques by growers.

Performance Goal

- To increase efficiency of production among growers through education.
- To assist poultry company personnel with the implementation of the most current scientifically based production and processing information in order to meet challenges in the coming decade.

Output Indicators

Performance Goal 1:

- Educational meetings, demonstrations, farm visits and/or field days held to educate growers on methods to improve production efficiency.
- Educational materials produced.
- Number of growers attending educational programs (including extension -related industry meetings), field days and receiving educational materials.

Performance Goal 2:

- Educational meetings and conferences conducted to impart the latest scientifically based information to poultry company personnel.
- Field demonstrations conducted to document the effectiveness of scientifically based production or processing information.
- Number of poultry company personnel appraised of scientifically based information.

Outcome Indicators

Performance Goal 1:

Estimated number of growers adopting practices outlined in educational programs which improve their productive efficiency through proper methods of sanitation; disease prevention, recognition, and control; ventilation; water management; feeder management; hot weather management; litter management; ammonia control; or dust control.

Performance Goal 2:

Number of poultry company personnel adopting scientifically based information involving compliance with environmental regulations, implementation of processing regulations, and disease control.

Key Components

Performance Goal 1:

Educational materials will be developed in conjunction with industry, government and university scientists in order to ensure the inclusion of the highest quality information. Lines of communication will be established with growers to provide educational information through face to face consultations, publications, newsletters and educational conferences. Informal surveys will be conducted to determine the adoption rate of practices advocated.

Performance Goal 2:

New technologies designed to assist in the implementation of processing regulations will be documented. Strategies to address compliance with environmental regulations will be developed. Procedures aimed at recognizing, preventing and controlling diseases will be formulated. Poultry company personnel will be advised of the materials and procedures developed. Field demonstrations will be conducted as appropriate. Adoption rates will be documented via informal surveys and economic impacts will be estimated via industry and government data.

Internal and External Linkages

Internal:

Extension Service and Agricultural Experiment Station faculty at the University of Arkansas will assist with the documentation of technologies, the development of strategies, and the perfection of procedures. These personnel will also assist with the development of educational materials for growers.

External:

Extension Service and Agricultural Experiment Station faculty in surrounding states (e.g. OK, MO, MS, TX, LA) will assist with educational efforts. The Arkansas Livestock and Poultry Commission will provide structure and (where necessary) regulatory authority for disease control efforts. The Poultry Federation (which now includes AR, MO and OK) will provide a vehicle for the dissemination of information to company officials. The Arkansas NRCS and Water Conservation Commission will assist with environmental educational efforts. The Arkansas Farm Bureau will provide vital links with growers. Other professional organizations and federal or state agencies will also provide support. Trade organizations such as the U. S. Poultry and Egg Association, the National Chicken Council and National Turkey Federation will assist by disseminating information to the

industry in other states.

Target Audiences

- Poultry Growers
- Poultry Company Personnel
- Other interested individuals

Program Duration

Long term: Greater than or equal to 5 years

Allocated Resources

- Total: 4.89 FTE, \$455,181; Federal (3b&c) - \$69,396
- Integrated: \$173,229; Projected Resources for FY2000-2004 are 2% annual increases.

Educational and Outreach Programs

- Grower meetings, workshops and expo's have been held throughout the state and more are in the planning stages. In addition, a newsletter aimed at growers has just been named ("Avian Advice") and the inaugural issue will come out in October.
- Educational meetings, scientific symposia and technical conferences designed for industry personnel are regularly scheduled. In addition, field demonstrations of promising technologies are done periodically.

Forest Management

Statement of Issue

Forests cover roughly half of Arkansas' land area and provide a diversity of benefits including solid wood products, wood fiber, wildlife habitat, recreation opportunities, water conservation, alternative products, and scenic beauty. The majority (58%) of these forests are owned by non-industrial private forest (NIPF) landowners.

Despite the growing importance of non-commodity forest amenities, timber and fiber production remain key factors in our nation's economy. The forest product industry employed some 47,400 Arkansans, contributed approximately \$1.17 billion in payroll, and, through secondary processing, contributed \$4.00 billion value-added dollars to Arkansas' economy in 1995.

Much of the timber harvested to supply the forest product industry comes from NIPF land. In 1997, 68% of the total harvest came from private forest lands. Education regarding forest product marketing, value-added processing, forest management, forest regeneration, best management practices, multiple use forest management, and sustainable forestry is therefore crucial to meet the expanding demand for forest products.

However, forest management does not occur in a vacuum. Public forest management policies, public perception, changing technology, differing viewpoints over management practices, and conflicts about forest land use can constrain landowner options and sometimes deeply divide communities. Education regarding conflict management is also important in contributing to the sustainability of forests and communities dependent upon forests.

Using a discussion and priority setting process, the County Extension Councils in ten Arkansas counties have identified this issue as a major emphasis for their long range education program. These councils are locally based at the county level and include stakeholders from various agencies, industries, farmers, landowners, individuals, county government, and interest groups.

Performance Goals

Increase landowner and other clientele understanding of sustainable forest management and knowledge of forest product marketing.

Output Indicators

- Educational meetings, workshops, demonstrations, field days, tours, and short courses conducted to educate clientele about forest product valuation, competitive bidding, marketing, and all dimensions of sustainable forest management including reforestation, BMP's, and wildlife habitat management.
- Educational meetings, workshops, demonstrations, field days, tours, and short courses conducted to educate clients about timber management including stand improvement, estate planning, developing management plans, site preparation, and herbaceous weed and shrub control.
- Educational meetings, workshops, demonstrations, field days, tours, and short courses conducted to educate clients about managing forest land enrolled in federal assistance programs.
- Educational meetings, workshops, demonstrations, field days, tours, and short courses conducted targeting value-added forest

product manufacturing including operating dry kilns, hardwood lumber grading, marketing, product development, and increasing manufacturing efficiency.

- Educational meetings, workshops, short courses, and information designed to facilitate landowner, stake holder, and community participation in public forest issues including conflict resolution, issue identification, collaborative planning, and policies affecting natural resource management.
- Educational materials produced (including electronically produced materials).
- Number of clientele attending educational meetings, workshops, demonstrations, field days, tours, and short courses.

Outcome Indicators

- Number of clientele who indicate an increased understanding of forest valuation, competitive marketing, tax treatment from timber income, and other components of forest management.
- Number of clientele who indicate an increased understanding of BMP's and Stream Side Management zones that can enhance/protect water quality, wildlife habitat, and be managed for forest products.
- Number of clientele who indicate an increased understanding of value-added processing, marketing of value-added products, and improved secondary processing mill efficiency thereby reducing wood waste.
- Increased economic value of timber sold, wood products produced, or money saved as a result of increased clientele understanding of forest valuation, value-added processing, and sustainable forest management.
- Changes in forest management practices among clientele resulting from educational programs.
- Acreage impacted by educational programs as measured by total acres enrolled in AFC forest management plans, the Tree Farm program, landowner associations, and other similar programs.

Key Components

Forest management education may include but not be limited to timber marketing, timber management, sustainable multiple-use forest management, stand improvement, forest regeneration, wildlife habitat management, alternative forest products, value-added processing, water quality enhancement, best management practices, wood waste utilization, reduction, and disposal, and forest policy.

Internal and External Linkages

Internal:

Extension Service, University, and Agricultural Experiment Station faculty of the respective cooperating institutions.

External:

- Arkansas Forestry Commission
- Arkansas Forestry Association
- NRCS
- Soil and Water Conservation Service
- Professional organizations
- USDA Forest Service
- The Nature Conservancy and other environmentally based organizations
- Arkansas Game and Fish Commission
- Forest Product Industries
- Association of Consulting Foresters
- Farm Bureau
- Regional Extension Forester, CSREES
- National Program Leader, CSREES

Target Audiences

- Nonindustrial Private Forest Landowners
- Forest Products Industry
- Secondary Wood Processing Firms
- Forestry Professionals and Consultants
- Other interested individuals

Program Duration

Long term: Greater than or equal to 5 years

Allocated Resources

- Total: 6.88 FTE, \$640,419; Federal (3b&c) - \$97,637
- Integrated: \$52,243; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **Landowner Workshops:** A series of forest landowner workshops are held annually in collaboration with the Arkansas Forestry Association, the Arkansas Forestry Commission, county extension faculty, NRCS, and other agencies. Topics covered include timber marketing, wildlife habitat management, forest estate tax planning, and other topics.

- **Arkansas Forest Resources Center Forestry Continuing Education Program:** A new program coordinator, an assistant extension specialist, was hired and a statewide steering committee created to provide increased support for continuing education. Plans include delivering 6 to 8 courses a year covering topics ranging from GIS applications in forest management to prescribed fire as a resource management tool. The target audience includes but is not limited to forestry professionals.
- **Alternative Forest Products:** Extension forestry personnel worked with the NRCS and the Northwest Arkansas Resource and Development Council to design and implement two workshops addressing sustainable forest management and opportunities in alternative forest products. Topics addressed included black walnut and shiitake mushroom production, wildflower seed and pollen collection, and other alternative products including floral greens, firewood, and wild edibles. As a result of the success of these workshops, a cooperative agreement between a national black walnut company and project participants was initiated that will provide demonstration and variety testing of black walnut cultivars.
- **Secondary Wood Processing and Sawmill Workshops:** In 1996, the first wood products specialist was added to the faculty of the Arkansas Forest Resources Center. This faculty member and a Extension forester established an educational program targeting primary and secondary wood product companies. Two workshops have been conducted addressing quality control in secondary wood product manufacturing. Extension personnel and a faculty member also received a USDA Rural Business Cooperative Service grant to investigate the feasibility of kiln drying and value-added wood-processing cooperatives and/or marketing associations. One workshop was held and others planned as part of this effort.
- **National Forest Communities Project:** Extension personnel in forestry and community development, lead by faculty at the University of Arkansas-Fayetteville designed, initiated, and facilitated a challenge cost share grant project with the USDA Forest Service. The purpose of the project is to assist selected communities adjacent to National Forest lands in creating or strengthening partnerships between the communities and the USDA Forest Service. This is especially important as the next planning process for the National Forests approaches. The hope is to explore appropriate avenues of collaborative decision-making that will facilitate more community input into the forest planning process and build communities' capacity for collaborative planning. Two conflict resolution workshops were held as part of this project .

Horticulture Production and Management

Statement of Issue

The Arkansas horticulture industry is a \$283 million industry that includes the commodity areas of fruits, vegetables, ornamentals and turf. Activities associated with these horticulture commodities include areas such as production, sales and marketing, installation, maintenance, and recreation. Consumer purchases or involvement in horticulture ranks as the #1 hobby in the United States.

Extension Service and Agricultural Experiment Station faculty of the respective cooperating institutions. Arkansas climate, soils, and location are well suited for the production and enjoyment of horticultural crops and products.

Using a discussion and priority setting process, the County Extension Councils in over half of Arkansas' counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate clientele to enhance economic development in Arkansas, to implement best management practices in horticulture enterprises, and to develop a system that is highly competitive in the global economy.

Output Indicators - Fruits & Vegetables

- Educational publications, mass media, and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties.
- Educational meetings, demonstrations, farm visits or field days held to educate commercial clientele and other interested parties.
- Workshops on nutrition, production, post harvest, marketing, and/or breeding and selection conducted to educate commercial clientele and other interested parties.
- Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials

Output Indicators - Ornamentals

- Educational publications, mass media, and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties.
- Educational meetings, demonstrations, nursery & greenhouse visits or field days held to educate commercial clientele and other interested parties
- Workshops on fertility, production, post harvest, marketing, and/or breeding and selection conducted to educate commercial clientele and other interested parties

- Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials

Output Indicators - Turf

- Educational publications, mass media, and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties.
- Educational meetings, demonstrations, farm visits or field days held to educate commercial clientele and other interested parties.
- Workshops on fertility, production, post harvest, marketing, and/or breeding and selection conducted to educate commercial clientele and other interested parties
- Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials

Output Indicators - Consumer

- Educational publications, mass media, and other materials produced as a means to disseminate new ideas to consumer clientele and other interested parties.
- Educational meetings and demonstrations held to educate consumers
- Workshops on horticulturally related topics conducted to educate consumers
- Number of individuals attending educational meetings, demonstrations, or workshops and receiving educational materials

Outcome Indicators - Fruits & Vegetables

- Number of participants that adopted new production technologies
- Number of new commercial operations
- Number of participants that reduced their chemical and fertilizer inputs

Outcome Indicators - Ornamentals

- Number of participants that adopted new production technologies
- Number of new commercial operations
- Number of participants that reduced their chemical and fertilizer inputs

Outcome Indicators - Turf

- Number of participants that adopted new production technologies

- Number of new commercial production operations and golf courses
- Number of participants that reduced their chemical and fertilizer management inputs

Outcome Indicators - Consumer

- Number of participants who report improved satisfaction from leisure gardening activities
- Number of participants who improved their home garden or landscape

Key Components

Horticulture education may include, but is not limited to, fertility, production, post harvest, marketing, propagation, breeding and selection.

Internal and External Linkages

Extension Service and Agricultural Experiment Station faculty of the respective cooperating institutions

External:

- Arkansas Horticulture Society
- Arkansas Nurseryman's Association
- Arkansas Turfgrass Association
- Arkansas Greenhouse Growers Association
- Arkansas/Oklahoma Horticulture Industry Show
- Arkansas Golf Course Superintendents Association of America
- NRCS
- Other professional organizations
- Arkansas Farm Bureau
- Other Federal and state agencies

Target Audiences

- Growers
- Consumers
- Allied industries
- Allied agribusiness
- Consultants
- Master Gardeners
- Other interested individuals

Program Duration

5 years

Allocated Resources

- Total: 15.65 FTE, \$1,456,766; Federal (3b&c) – \$222,096
- Integrated: \$381,325; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Starting a Horticulture Business Workshop - 2-day workshop designed to help clientele learn the basics about starting a horticulture business
- Retail Garden Center Spring Tune-up Workshop - multi-site workshop designed to prepare retail businesses prepare for spring/summer gardening questions and problems
- Native Plant Workshop - intensive workshop on native plant topics
- Fruit Tree Pruning Workshop
- Hobby Greenhouse Workshop
- Landscape Construction Workshop - hands-on workshop on a variety of landscape topics
- State Master Gardener Meeting - 2-day intensive meeting on general horticulture topics

Alternative Agricultural Enterprises

Statement of Issue

There are approximately 43,937 farms in Arkansas. Many of these farms are in dire economic stress. The addition of an alternative crop or livestock enterprise to many of these farms would enhance cash flow, provides extra income, diversifies operations, spread risks, and provides year round employment to workers who many times are employed on a seasonal basis.

In this context, alternative agricultural enterprises have the potential to help economically solidify farming operations, thereby, adding both income and stability to farming. Using a discussion and priority setting process, the County Extension Councils in 15 Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate clientele on the opportunities afforded by the addition of alternative agricultural enterprises and related enterprise planning, value-added products, record keeping and marketing of speciality products to farms.

Output Indicators

- Educational and technical materials produced to support programs.
- Educational meetings, tours, workshops, and/or farms visits to educate clientele on production practices.
- Educational meetings, tours, workshops, and/or farms visits to educate producers on farm value -added production.
- Educational meetings, tours, workshops, and/or farm visits to educate producers and other interested parties on alternative agricultural marketing.
- Number of producers attending educational programs, field days, etc. and receiving educational materials.

Outcome Indicators

Number of producers adopting new enterprises.

Key Components

Alternative agricultural education may include, but not be limited to, enterprise planning, enterprise integration production, value added, marketing and economic assessment of alternative cropping and livestock systems.

Internal and External Linkages

Internal:

Extension Service and Agricultural Experiment Station Faculty of the University of Arkansas, Fayetteville, University of Arkansas, Pine Bluff, University of Arkansas, Monticello, and Arkansas State University, Jonesboro.

External:

- Commodity Grower Groups
- Arkansas Farm Bureau
- Delta Enterprise Network
- Appropriate Technology Transfer for Rural Areas
- Agriculture Research Service
- Natural Resource Conservation Service
- Other state and federal agencies

Target Audiences

- Farmers
- Agribusiness personnel
- Commercial Marketing Personnel
- Other education entities
- Other interested individuals

Program Duration

5 year duration: FY 2000-2004

Allocated Resources

- Total: 4.22 FTE, \$392,815; Federal (3b&c) – \$59,888
- Integrated: \$46,845; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **Pine Straw Production Program:** Publications, slide sets, producer meetings, demonstrations, workshops and tours address Pine Straw production as an alternative crop.
- **Rabbit Production:** Publications, slide sets and producer meetings address production, disease control, nutrition, housing and marketing of rabbits.
- **Ratite Production:** Grower meetings, in-service training, publications, slide sets and news articles address production, disease control, marketing and economics of ratite management

- **Kenaf Production:** Publications and a statewide meeting addressed kenaf production and marketing
- **Farm Management and Environmental Record Keeping System:** Produced and updated computerized record keeping system for small and family farmers.
- **Backyard Poultry Production:** Production meetings address disease prevention, nutrition and housing for adult and youth audiences, commercial and fancy poultry, and small flock production for food and on farm sales.
- **Goat Production:** Programs address youth educational activities on production, fitting and showing of goats. Slide sets and grower meetings address commercial meat goat production, prevention, nutrition, selection, and marketing.
- **Herb Production:** Tours and educational materials address medicinal and culinary herb production and marketing.
- **Caged Bird Production:** Educational meetings and informational materials address disease, nutrition, housing and marketing of Caged Birds.

Agricultural Marketing, Management and Farm Policy

Statement of Issue

The structure of agriculture is rapidly changing with the passage of the 1996 Federal Agriculture Improvement and Reform Act. While providing pre-determined but declining contract payments, this market-oriented legislation is shifting greater responsibility of managing risk from the federal government to the individual farm family. Many other forces are also increasing the risk faced by producers, including global competition, tax law changes and new technology. Although a broad array of established risk management tools exist, many producers have not taken advantage of them.

Using a discussion and priority setting process, the County Extension Councils in over half of Arkansas' counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To help clientele increase the efficiency of production through improved marketing, management, and farm policy decision making skills.

Output Indicators

- Educational meetings held in which management, marketing and/or farm policy information was presented
- Participants attending educational meetings and receiving educational materials related to management, marketing, and farm policy
- Educational materials produced

Outcome Indicators

- Number of producers that implemented changes in management practices as a result of farm management educational efforts
- Number of producers that implemented changes in management practices as a result of commodity and livestock marketing educational efforts
- Number of producers that implemented changes in management practices as a result of farm policy educational efforts

Key Program Components

- Farm Financial Management Seminars
- Commodity Marketing Seminars
- Policy Analysis and Updates
- Market News Service
- Situation and Outlook Reports
- Educational Meetings, Conferences, Workshops

Internal and External Linkages

Internal:

Cooperative Extension Service and Agricultural Experiment Station faculty and other state educational institutions

External:

- Arkansas Farm Bureau
- USDA, Risk Management Agency
- USDA, Farm Service Agency
- Arkansas Farm Credit Associations
- Arkansas Bankers Association
- Arkansas State University
- Other federal and state agencies

Target Audiences

- Full-time Producers
- Part-time Producers
- Agribusiness
- Consultants
- Other interested individuals

Program Duration

Long-Term

Allocated Resources

- Total: 9.86 FTE, \$917,809; Federal (3b&c) – \$139,928
- Integrated: \$95,151; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **Research Verification Trials:** Economic analyses allow for an examination of the University of Arkansas' recommended production practices and is a method of strengthening Extension agents' expertise in recommended technology.
- **Enterprise Production Cost Estimates:** A series of Extension Technical Bulletins are developed annually for estimating production costs of wheat, soybeans, cotton, rice, corn, and grain sorghum.
- **Vegetable Economics:** County agents and tomato growers receive weekly newsletters during the tomato season that contains information on the U.S. tomato market situation.
- **Farm Management and Marketing Newsletter:** This quarterly publication is designed to bring timely management information to county extension agents and agricultural producers.
- **Agricultural Marketing Seminar Series:** The University of Arkansas Cooperative Extension Service and Arkansas Farm Bureau Federation have partnered to offer a comprehensive commodity marketing education program to Arkansas producers.
- **Soybean Research Verification Program Marketing Contest:** As part of the education component of the Soybean Research Verification Trials, cooperators in the program have the opportunity to participate in a marketing contest.
- **Livestock Marketing:** Livestock auction reports are prepared daily and distributed to producers by radio, newspapers, television, mail outs and the Internet.
- **Commodity Situation and Outlooks:** Situation and outlook presentations are offered to counties to include in production meetings and other forums to emphasize marketing.
- **Agricultural Policy:** This program places primary emphasis on Arkansas farm firm systems and supporting infrastructure, focusing on the public policy issues, alternatives, and consequences that are impacting Arkansas' food industry.
- **Soybean Production Management Alternatives Under Full Flexibility:** The key objective of this research is to identify and financially analyze soybean production management alternatives under full flexibility for select farm systems in the Arkansas Delta, that have the greatest potential for improving producer profitability.

Goal 2. A safe and secure food and fiber system

Safe Food – From Farm to Table

Statement of Issue

The reported incidence of food borne illness from pathogenic bacteria is increasing. According to figures from the Centers for Disease Control, food borne illness occurs in Arkansas at a rate of 50 to 60 cases per 100,000 population. These illnesses may be life threatening or trigger chronic disease. According to the report “Food Safety From Farm to Table,” the increase in food borne disease can be partially attributed to the emergence of new food borne pathogens and existing organisms becoming more virulent or finding new ways to evade immune defenses. In addition, changing patterns of consumption, an aging population, more persons with chronic illnesses, and wide variation in food handling and preparation practices are contributing to increased vulnerability of the population to food borne disease. A key to reversing this trend of increased disease is education for consumers and for food handlers throughout the food production and marketing system.

Using a discussion and priority setting process, the County Extension Councils in one-third of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To reduce the incidence of food borne illness, Extension clientele will adopt recommended food handling and preparation practices.

Output Indicators (Consumers)

- Number of consumers participating in educational short courses or meetings related to sanitation and safety in food handling.
- Number of people reached through food safety awareness programs, demonstrations, or displays
- Number of media articles produced on food safety issues

Output Indicators (Producers)

- Number of participants in educational programs leading to certification for food handlers (i.e. ServSafe programs and Better Process Control Schools).
- Number of non-certification programs for food handlers.
- Number of food safety educational programs for growers, producers, distributors, or retailers.
- Number of participants attending non-certification programs for food handlers.
- Number of growers, producers, distributors or retailers attending food safety educational programs.

Outcome Indicators (Consumers)

Number of consumers who report improved sanitation in food handling.

Outcome Indicators (Producers)

- Number of food handlers certified.
- Number of food service managers who report improved food handling practices within a commercial establishment.
- Number of growers, producers, distributors, or retailers implementing one or more practices to minimize food safety hazards.

Key Program Components

Food safety education may include but not be limited to the production, storage, service, and sanitation of safe foods at all stages in the food system.

Internal and External Linkages

Internal:

Extension Service and Agricultural Experiment Station faculty with the Division of Agriculture, University of Arkansas including but not limited to Cooperating Scientists with the Institute of Food Science and Engineering and faculty of the Center of Excellence for Poultry Science.

External:

- Division of Sanitarian Services, Arkansas Department of Health
- Ozark Food Processors Association
- Arkansas Hospitality Association
- Arkansas Farm Bureau
- Food and Drug Administration

Target Audience(s)

- Older adults
- School age youth
- Parents and care givers of young children
- Volunteer food handlers
- Food service managers
- Food processors
- Food growers, producers, distributors, and retailers

Program Duration

Long term

Allocated Resources

- Total: 9.22 FTE, \$858,235; Federal (3b&c) – \$130,845

- Integrated: \$182,481; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Consumer food safety education programs have been targeted at a broad range of audiences. Included were at-risk individuals such as pregnant women, parents of infants, and older adults, limited resource youth and adults, and home food preservers/preparers.
- By Federal law, all food processors producing low-acid foods must be operated under the supervision of people trained in safe plant operation. To assist food processors in meeting this requirement, the FDA-FPI-NFPA Better Process Control School is offered annually by the University of Arkansas' Cooperative Extension Service and the Institute of Food Science and Engineering.
- The working partnership started in 1994 between the Arkansas Hospitality Association, the Arkansas Department of Health and the University of Arkansas Division of Agriculture remains active and strong. Extension Family and Consumer Science agents and County Sanitarians conduct classes targeting food service managers and supervisory personnel. This partnership represents the largest single source of the delivery of the National Restaurant Association ServSafe program in the state.

Goal 3: A healthy, well-nourished population

Improving Health

Statement of the Issue

The typical Arkansas diet has too few fruits, vegetables and whole-grains and too much fat. The poor diet in conjunction with insufficient physical activity, contributes to the development of serious health problems. These problems include heart disease, stroke, cancer, diabetes, osteoporosis, and obesity.

- In 1996, heart disease was the leading cause of death in Arkansas resulting in 8,310 deaths. Cancer, the second leading cause of death, claimed 5,960 lives. Another 2,294 deaths occurred as the result of stroke, the third leading cause of death in Arkansas.

- In the past five years, the number of obese adults has increased by 10 percent and the number of obese children by 20 percent.

- These health conditions are estimated to cost Arkansans an estimated \$3.9 billion annually in medical charges and lost productivity.

Using a discussion and priority setting process, the County Extension Councils in 80 percent of Arkansas counties have identified managing diet, health and wellness as a major emphasis for their long range educational programs. The FY4H program focuses on improving health and wellbeing by providing education in the areas of physical activity, women's health issues and nutrition education.

Performance Goal(s)

To improve the health of Arkansans through proper nutrition and regular physical activity.

Output Indicators: Nutrition

- Number of educational programs offered on topics related to one or more of the Dietary Guidelines for Americans.
- Number of participants attending educational programs on topics related to one or more of the Dietary Guidelines for Americans.
- Number of people reached through awareness programs, exhibits and media outlets based on topics related to one or more of the Dietary Guidelines for Americans.
- Number of educational resources prepared related to nutrition and dietary guidelines.

Output Indicators: Physical Activity

- Number of educational programs offered that relate to physical activity.
- Number of participants attending educational programs related to physical activity.
- Number of people reached through awareness programs, exhibits and media outlets based on topics related to physical activity.
- Number of educational resources prepared related to physical activity.

Output Indicators: Women's Health

- Number of educational programs on women's health issues.
- Number of participants attending educational programs on women's health issues.
- Number of people reached through awareness programs, exhibits and media outlets based on topics related to women's health issues.
- Number of educational resources developed related to women's health issues.

Outcome Indicators: Nutrition

- Number of people who increase consumption of fruits and vegetables.
- Number of people who increase consumption of whole-grain foods.
- Number of people who increase consumption of calcium-rich foods.
- Number of people who decrease consumption of fat and/or saturated fat.

Outcome Indicators: Physical Activity

- Number of people who increase physical activity.

Outcome Indicators: Women's Health Issues

- Number of women who report they *plan to adopt* one or more recommended practices related to women's health*
- Number of women who report they *have adopted* one or more recommended practices related to women's health*

[*Recommended practices related to women's health issues relate to mammography, menopause, osteoporosis, pap smears, reproductive health, adult screening, immunizations, reduced risk of heart disease, reduced blood pressure, reduced cholesterol level, increased aerobic fitness, maintaining proper weight, smoking cessation, etc.)

Key Program Components

Special-Funds Programs:

- The Family Nutrition Education Program
- The Expanded Food and Nutrition Education Program
- Strong Families Safe Communities Program
- The Best Care - Child Care Provider Training

Topics may include but are not limited to the promotion of the Dietary Guidelines for American through activities such as

- 5-A-Day Campaign
- Healthy Weight Management
 - Diabetes Education
 - Heart Disease and Stroke Prevention
 - Physical Activity
 - Women's Health Issues
 - Health Literacy

Internal and External Linkages

Internal:

- FY4-H Faculty
- University of Arkansas Faculty
- University of Arkansas for Medical Sciences Faculty

External:

- Arkansas Department of Human Services
 - Division of Early Childhood Education
 - Division of County Operations, Food Stamp Program
 - Arkansas Department of Health
 - Supplemental Food Program for Women, Infants and Children (WIC)
 - WIC Farmers' Market Nutrition Program
 - Arkansas Diabetes Control Program
 - 5-A-Day Coalition
 - Arkansas Department of Education
 - AR Cares
 - Transition Employment Assistance (TEA) Coalition
 - American Diabetes Association, Arkansas Affiliate
 - Folic Acid Coalition
 - University of Arkansas at Little Rock Extended Learning Center
 - Arkansas Kids Count Coalition

Target Audiences

- Adults
- Adolescents
- Children and youth
- Adult and youth Food Stamp Program recipients and those eligible for food stamp benefits
- Transitional Employment Assistants (TEA) customers
- At-risk families and youth

- Caregivers of young children including parents and child care providers in day care centers and family day care homes

Program Duration

Long-term

Allocated Resources

- Total: 25.78 FTE, \$2,399.708; Federal (3b&c) – \$365,856
- Integrated: \$39,099; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Family Nutrition Education Program (FNEP) provides comprehensive food, nutrition and resource management education to Food Stamp recipients and persons eligible for Food Stamps throughout the state.
- Expanded Food and Nutrition Program (EFNEP) provide nutrition, food safety and food budgeting education to limited income homemakers with children, 19 years of age and under, and youth, 5 - 19 years of age, in certain target counties.
- Strong Families-Safe Communities Program provides nutrition, parenting and money management education to high-risk parents, children and youth in high poverty rural counties in high-crime housing units in the state.
- *NoonLiting: Weight Control That Works*, is a 15-week program that focuses on healthy eating and regular exercise for weight management.
- The *Right Bite: Cooking School for People with Diabetes and Those Who Love Them*, is a three-session program that focuses on the importance of limiting dietary fat, saturated fat, cholesterol and sodium for heart health and weight control among diabetics. It teaches practical menu planning and food preparation skills to help people with diabetes follow a healthful diet.
- The Best Care-Child Care Provider Training Program meets the Arkansas state licensing requirement that providers must attend classes each year and is available to any child care provider in the state. The program covers topics such as physical education for kids; healthy snacks and lost care meals; business management; record keeping and taxes; working effectively with parents; and proactive behavior management.

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

Maintaining Agricultural Sustainability Through Conservation of Natural Resources and Protection of the Environment

Statement of Issue

Arkansas agriculture faces many issues related to natural resource conservation and environmental protection that threaten its sustainability for many producers. The most significant issues include:

Groundwater Conservation:

- Nearly 4 million acres of cropland in Arkansas is irrigated with groundwater
- State has declared 11 counties as critical relative to groundwater depletion

Surface Water Quality:

- Agriculture is a potential cause of water use impairments in Arkansas
- Urban nonpoint source pollution is an increasingly important issue

Soil Quality:

- Soil erosion threatens the long-term productivity for row crop production
- Soil phosphorus is approaching environmentally sensitive levels where long-term applications of animal waste have been made to pastureland

Spatial Technology:

New technology such as global positioning systems (GPS) and geographic information systems (GIS) are powerful new tools in production agriculture and natural resource management. This technology allows more detailed management of agricultural inputs (fertilizer, pesticides, animal waste, etc.) with the potential benefits to production economics and to the environment by lessening adverse impacts.

Wildlife:

- The loss of wildlife habitat has slowed but continues to be a major issue.
- Hunters and anglers contribute over \$600 million to Arkansas' economy.

Using a discussion and priority setting process, the County Extension Councils in one-third of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate clientele on how to maintain agricultural sustainability while considering natural resources and protecting the environment.

Output Indicators – Groundwater Conservation and Surface Water Quality

- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on groundwater conservation, proper irrigation methods for improving water use efficiency, shifting irrigation water use to surface water via surface reservoirs and/or river diversion by irrigation districts.
 - Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on water conservation methods for domestic, municipal, and industrial water use and on reducing urban nonpoint source pollution through proper lawn care.
 - Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on best management practices to lessen the agricultural impacts on surface water quality and on watershed issues.
 - Number of educational materials written and/or distributed (i.e. fact sheets, news releases, conference proceedings, newsletters, handouts, etc.) on groundwater conservation and proper irrigation methods.
 - Number of educational materials written and/or distributed (i.e. fact sheets, news releases, conference proceedings, newsletters, handouts, etc.) on best management practices for reducing agricultural and urban non-point source pollution as well as watershed issues.
- Number of clientele participating in educational meetings, workshops, and seminars.

Output Indicators – Soil Quality

- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on conservation tillage methods and best management practices for soil erosion.
- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on proper soil management practices such as soil testing, nutrient management (nitrogen and phosphorus) residue management, and land leveling.
- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on soils adversely affected by salinity and/or alkalinity, compaction, and poor physical condition.
- Number of clientele participating in educational meetings, workshops, and seminars.

Output Indicators – Spatial Technology

- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on uses of GIS and GIS applications in production agriculture (i.e., yield monitoring, product evaluation, grid soil sampling, disease scouting, field boundary mapping, acreage determination, aerial application, etc.)
- Educational meetings, demonstrations, farm visits, and/or field days held to educate clientele on uses of GIS and GPS in natural resource management (i.e. forest management, watershed characterization, water quality protection, wetland protection, natural resource mapping, wildlife habitat, etc.)
- Number of clientele participating in educational meetings, workshops, and seminars.

Output Indicators – Wildlife Management

- Educational meetings, workshops, demonstrations, and/or field days held to educate clientele on enhancing wildlife habitat, prevention and control of wildlife damage and wildlife income.
- Educational presentations in schools and through 4-H clubs to teach youth wildlife identification, management, and habitat practices.
- Number of educational materials written and/or distributed (i.e. fact sheets, news releases, conference proceedings, newsletters, handouts, etc.).
- Number of clientele participating in educational meetings, workshops, and seminars.

Outcome Indicators – Groundwater Conservation and Surface Water Quality

- Number of participants who adopt proper irrigation management practices such as border irrigation, irrigation scheduling, multiple inlet for rice, etc. and other groundwater conservation methods.
- Number of participants who adopt water conservation practices for domestic, municipal, and industrial water use.
- Number of clientele who adopt agricultural best management practices to reduce impact on surface water quality.
- Number of homeowners who adopt proper lawn care practices such as soil testing, following label directions or extension pesticide recommendations.
- Number of clientele who participate in Farm*A*Syst and Home*A*Syst.

Outcome Indicators – Soil Quality

- Number of clientele who adopt conservation tillage and other soil erosion best management practices.
- Number of clientele who adopt proper soil management practices including soil testing, land leveling, and

residue management.

- Number of clientele who adopt practices to deal with soils affected by salinity and/or alkalinity including soil testing, well testing, soil amendments, water management, subsoiling, etc.

Outcome Indicators – Spatial Technology

- Number of clientele who adopt GIS and GPS for production agriculture purposes including aerial applicators.
- Number of clientele who adopt GIS and GPS for natural resource management, watershed characterization, and general map making and spatial analysis.

Outcome Indicators – Wildlife

- Number of clientele who adopt wildlife management practices that enhance wildlife habitat or prevent and control wildlife damage to property.

Key Components

Natural resource conservation and environmental protection education as related to sustaining agriculture may include but is not limited to water conservation through proper irrigation management and scheduling, well testing, water quality testing, conservation tillage, soil testing for nutrient management, watershed water quality projects, Farm*A*Syst/Home*A*Syst reducing urban non-point source pollution through proper lawn care, precision agriculture, natural resource management with GIS and GPS, wildlife education, and financial incentive programs such as EQIP. Arkansas Extension will continue to link to the Southern Region SARE program efforts, participate in multi-state educational and professional training programs and participate in regional and national forums on water quality, small farm programs, Farm*A*Syst/Home*A*Syst, tillage management and farming systems development.

Internal and External Linkages

Internal:

- Extension Service and Agricultural Experiment Station faculty of the respective cooperating institutions (including 1890 institution)
- Other state educational institutions
- University of Arkansas Center for Advanced Spatial Technology

External:

- State and federal conservation, environmental, and natural resource agencies
- SARE, Southern SAWG and other participants in the Sustainable Agri Network
 - National Farm and Home*A*Syst programs
 - The Arkansas Conservation Partnership
 - Professional Organizations
 - Regional and National Extension Committee's

- Conservation Societies
- Private and Non-profit Conservation organizations
- Arkansas Environmental Federation
- State and federal conservation, environmental, and natural resource agencies

Target Audiences

- Agricultural Producers
 - Landowners
 - Certified Crop Advisors
 - Consultants
- Conservation District Directors
 - State Agency personnel
 - Livestock Industry personnel
 - Homeowners
 - Municipalities
 - Industry
 - Agricultural Producer Organizations
 - Watershed Organizations
- School Youth
 - 4-H Club Youth
 - Wildlife Organizations

Program Duration

Long term (> 5 years)

Allocated Resources

- Total: 10.17 FTE, \$946,665; Federal (3b&c) - \$144,327
- Integrated: \$42,250; Projected Resources for FY2000-2004 are 2% annual increases.

Education and Outreach Programs

- Annually conduct water quality and nutrient management education programs for conservation professionals, community leaders, extension agents and farmers in threatened watersheds identified throughout Arkansas and in concerned adjoining states.
- Continued education and development support for Farm and Home*A*Syst educational materials for use in pollution prevention programs both in Arkansas and Nationally.
- Water conservation education programs conducted in “Critical Water Use Areas” as they are identified by the Arkansas Soil and Water Conservation Commission. Continue cooperation with Louisiana Extension in program development for the Sparta Aquifer.
- Conduct wildlife habitat development education programs for both youth and adults. Continued promotion and

development of the “Arkansas Acres for Wildlife” and 4-H Rice for Ducks programs and other joint ventures with the Arkansas Game and Fish Commission and the National Wildlife Habitat Evaluation Invitational Contest.

- Continued leadership development efforts in the “Building Common Ground” and “Conflict Resolution” skills area as these leadership capabilities relate to natural resource management issues.
- Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) training for agents and farmers with emphasis on development related data sets and systems. The information and its management offers farmers new ways to assess and direct management decisions and production inputs.
- Environmental management educational programs for County Agents, consultants, financial management consultants and farmers. The program emphasis is focused on protecting both the natural resource base and farmers from environmental negligence liability.

Animal Waste Management

Statement of Issue

Arkansas has 55,000 dairy cattle on 600 farms and 850,000 head of swine placed at one time on 450 farms (annual production is almost 2 million head). Annual broiler production is 1.2 billion birds on 5000 farms and 30 million turkeys are produced on 800 farms. Another 27 million chickens are in place at any time on about 1000 farms. Annual Arkansas farm gate income from livestock and poultry is \$2.9 billion before support services, industry, or further processing are added.

Confined livestock and poultry operations have resulted in the concentration of manure derived nutrients in certain areas of the state. Phosphorus (P), the primary nutrient of concern, has accumulated to higher than desired levels in soils on many livestock and poultry farms that have been in operation over ten years. This has resulted in increased P runoff and accumulation of P to undesirable levels in some surface waters of the state. However, it is also known that livestock and poultry manures are valuable soil amendments that when properly applied can increase soil tilth and fertility with minimal negative effects to the environment. Much of the beef cattle industry in Arkansas is dependent on forage produced by nutrients from swine and poultry.

All Arkansas producers with confined animal feeding operations that utilize liquid manure handling systems (regardless of size) require a permit for manure handling. Permit elements include nutrient management, specified application sites, maximum application rates, annual training for owner/operators and annual reporting requirements.

All Arkansas poultry producers are encouraged by state and federal agencies and poultry integrators to voluntarily comply with appropriate BMP's, to develop a nutrient management plan for their farms, and to attend environmental education programs.

Using a discussion and priority setting process, the County Extension Councils in one-third of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate livestock and poultry producers in environmentally sound manure management and utilization practices to protect ground and surface waters of the State of Arkansas and bordering states with shared watersheds.

Output Indicators

- Number of producers, industry, or agency personnel attending education programs.
- Educational meetings held with swine and poultry industry representatives, State and Federal agency personnel, and U of A research faculty to identify and discuss animal waste management issues.
- Soil test databases developed from selected livestock and poultry farms, and all animal manure samples processed through the U of A testing programs.

- Annual certification training meetings conducted for all owner/operators of confined animal operations with liquid manure handling systems.
- Educational meetings, field days, and/or demonstrations held to educate clientele on liquid and dry animal waste management.
- Educational materials produced.

Outcome Indicators

- Number of animal waste violations cited by Arkansas Department of Environmental Quality.
- Number of growers with confined livestock and poultry operations that voluntarily participate in preparing nutrient management plans for their farm (preparation of plans by others).

Key Components

Livestock and poultry waste management education will include litter analysis, soil testing, storage and handling options, dead animal disposal, manure application rates and procedures, transportation issues, nutrient management, and record keeping/reporting.

Internal and External Linkages

Internal:

Extension and Research faculty of the University of Arkansas system and other educational institutions.

External:

Natural Resources Conservation Service, Arkansas Soil and Water Conservation Commission, Arkansas Department of Environmental Quality, Arkansas Livestock and Poultry Commission, livestock and poultry industry groups and equipment and service providers.

Target Audience

Growers, farmers, commercial litter/manure cleanout operators, agency personnel, and industry personnel.

Allocated Resources

- Total: 5.12 FTE, \$476,591; Federal (3b&c) – \$72,660
- Integrated: \$33,863; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Annual training for livestock and poultry producers with liquid animal waste permits:** Regulation 5 of the Arkansas Department of Environmental Quality requires all liquid animal waste permit holders to receive four hours of annual training on the operation of facilities and related environmental issues. The Cooperative Extension Service is responsible for coordination of the training and developing the curriculum.
- Grower education for producers with livestock and poultry operations that handle manure and litter without added water (dry manure):** The “dry” program in Arkansas is closely monitored by state and federal agencies, but is a voluntary program. All growers are encouraged to have a nutrient management plan for their farms, even if it is an unregulated AFO, and Extension takes the lead in organizing and presenting this training for broiler producers, dairymen, and cattlemen
- Multi-agency and industry partnership:** The Cooperative Extension Service has taken a leadership role in Arkansas to work with and help coordinate waste management education programs with other interested federal and state agencies and animal industry. These include the Natural Resources Conservation Service, The Environmental Protection Agency, The Arkansas Soil and Water Conservation Commission, The Conservation Districts, The Arkansas Department of Environmental Quality, and industry representation from dairy, poultry, swine and beef.
- Farm*A*Syst:** This is a broad program that includes livestock waste management education work. It is a voluntary and confidential self-assessment that owner/operators can conduct for their own farmstead to determine the environmental pollution potential associated with different farmstead activities including but not limited to manure management.

Cotton Pest Management Integrated Pest Management

Statement of Issue

Integrated Pest Management (IPM) is the long-term and focused application of biological, cultural, mechanical, and chemical pest control methods based on increased monitoring and knowledge of the crop production ecosystem.

The USDA IPM Initiative goal is to insure that 75% or more U. S. farms utilize IPM practices for pest control by the year 2000- currently it is estimated that about 50% of farms use IPM in the United States.

Using a discussion and priority setting process, the County Extension Councils in two-thirds of Arkansas' counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

- Educate clientele on integrated pest management practices for sustained productivity and plant protection.

Output Indicators - Cotton Pest Management

- Educational meetings, demonstrations and/or field days held to educate clientele on cotton pest management.
- Scouting programs, pheromone trapping programs, resistance monitoring, and related biological surveys conducted to facilitate IPM practices in cotton.
- Conventional and electronic publications produced that promote the adoption of IPM principles in cotton pest management.
- Number of clientele attending educational programs or receiving materials.
- Number of clientele materials written and/or distributed.

Output Indicators - Integrated Pest Management

- Educational meetings, demonstrations and/or field days held to educate clientele on integrated pest management.
- Scouting programs, pheromone trapping programs, resistance monitoring, and related biological surveys conducted to facilitate IPM practices.
- Conventional and electronic publications produced that promote the adoption of IPM principles.

- Number of clientele attending educational programs or receiving materials.
- Number of clientele materials written and/or distributed.

Outcome Indicators - Cotton Pest Management

- Number of clientele involved in scouting and survey programs in cotton.
- Number of clientele utilizing other IPM practices.

Outcome Indicators - Integrated Pest Management

- Number of clientele involved in scouting and survey programs.
- Number of clientele utilizing other IPM practices.

Key Components

Integrated Pest Management and Cotton pest Management education may include but not be limited to scouting, pheromone trapping, surveys, educational materials, resistance monitoring, pest species identification, calibration and application, etc.

Internal and External Linkages

Internal:

- Extension Service and Agricultural Experiment Station Faculty of the respective cooperating institutions.
- Other state educational institutions.

External:

- Arkansas State Plant Board
- State Environmental Agencies
- Commodity/Grower Groups
- Professional organizations
- Arkansas Farm Bureau
- Agricultural Council of Arkansas
- Arkansas Boll Weevil Eradication Foundation
- Other federal and state agencies

Target Audiences

- Growers

- Agribusiness
- Consultants
- Other interested individuals

Program Duration

Long Term

Allocated Resources

- Total: 24.45 FTE, \$2,275,906; Federal (3b&c) – \$346,981
- Integrated: \$469,555; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **County-Based IPM Programs:** Program in cotton, rice, and soybean for IPM technology transfer to growers and other agri-business clientele.
- **IPM Outreach Program:** Information delivery program for growers and consultants on current IPM technology for pest control and crop management.
- **IPM Website:** Current information on pest status and management are listed.
- **IPM Newsletter:** Weekly updates on pest status and crop development are published for distribution to county agents, growers, and agribusiness clientele.
- **Cotton Aphid Fungus Survey:** Service provided to growers and consultants on development of the cotton aphid fungus, *Neozygites fresenii*.
- **Insecticide Resistance Monitoring:** In-season insecticide resistance levels are monitored to aid in proper insecticide selection.
- **Statewide Multi-Species Pheromone Trapping Program:** Cotton bollworm, tobacco budworm, beet armyworm, boll weevil, true armyworm, and gypsy moth are monitored to determine population frequencies.
- **Rice and Wheat Disease Monitoring Program:** Survey conducted annually to determine disease levels and frequencies to determine fungicide needs.
- **COTMAN Program:** Computer based management program for cotton, used to assist growers and consultants in determining crop development, insecticide termination, and defoliation.
- **Minimum Input Weed Control Program for Soybeans:** Technology developed to assist growers in using the most economical rates for efficient weed control.
- **Emphasis Programs for Row Crops and Pasture:** Series of IPM program approaches for use in county programs.

Pesticide Applicator Training

Statement of Issue

By Federal and State laws, applicators of restricted use pesticides must be certified or work under the direct supervision of a certified applicator. Applicators must be periodically re-certified by attending educational programs on pesticide safety, integrated pest management, endangered species protection, groundwater protection, the Worker Protection Standard, and other appropriate topics.

Federal requirements stipulate that multi-state educational activities should be implemented for various Extension programs. Arkansas, Louisiana, and Mississippi have chosen Pesticide Applicator Training as multi-state cooperative effort. In order to produce food and fiber and protect the environment and human health, safe use of pesticides is essential.

Using a discussion and priority setting process, the County Extension Councils in nine Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

- Educate pesticide applicators and other interested persons in the safe use of pesticides.

Output Indicators

- Educational publications, slide sets, study guides and other materials produced as needed to conduct the program.
- Educational meetings held to certify or re-certify commercial and private applicators.
- Educational meetings held to educate other interested parties.
- Applicator surveys conducted to determine changes in pesticide application practices.
- Number of individuals (not including private and commercial applicators) attending pesticide educational programs.
- Two multi-state workshops conducted with Louisiana and Mississippi to re-certify individuals from all three states in the fumigation and turf and ornamental categories.
- Number of private and commercial/non-commercial applicators attending the two multi-state re-certification workshops for the fumigation and turf and ornamental categories.

Outcome Indicators

- Number of commercial applicators certified and re-certified
- Number of private applicators certified and re-certified
- Individuals changing pesticide application practices as a result of the educational program

Key Components

Pesticide safety education may include but not be limited to groundwater protection, food safety, personal protective equipment, labeling, endangered species protection, minimization of pesticide drift, and worker protection standards.

Internal Linkages

- Extension Service and Agricultural Experiment Station faculty
- Other state educational institutions

External Linkages

- Arkansas State Plant Board
- Arkansas Department of Environmental Quality
- Commodity/grower groups
- Professional organizations
- Other Federal and State agencies – Louisiana State University Cooperative Extension Service, Mississippi State University Cooperative Extension Service

Target Audiences

- Farmers
- Commercial/Non-Commercial pesticide applicators
- Consultants
- Other interested groups and individuals

Program Duration

Long term

Allocated Resources

- Total: 3.69 FTE, \$343,480; Federal (3b&c) – \$52,366
- Integrated: \$3,403; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Certification and re-certification programs for private and commercial pesticide applicators are

conducted statewide each year.

- Survey questionnaires evaluating the effectiveness of the programs were provided to attendees (private and commercial) of the P.A.T. sessions in 1998/1999.
- Educational programs on pesticide safety are provided, upon request, to groups other than private or commercial applicators (ex., Master Gardener participants)
- Preliminary work was begun in 1999 on the two multi-state educational programs for fumigators and turf and ornamental pesticide applicators in Arkansas, Louisiana, and Mississippi.

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

Imported Fire Ant Education Program

Statement of Issue

Imported fire ants infest over 275 million acres in thirteen states. Within Arkansas 27 counties are infested to the point of quarantine with 16 other counties having isolated populations.

- Fire ants can pose significant health threats to allergic individuals
- Fire ants can have a negative economic impact on real estate property values, commerce, agricultural and livestock production, and wildlife.
- Fire ants reduce quality of life through negative impacts such as curtailing outdoor activities and damaging electrical equipment.
- Uninformed Arkansans often use ineffective and environmentally detrimental management techniques to attempt fire ant control (ex. use of gasoline which can potentially contaminate waters)

Using a discussion and priority setting process, the County Extension Councils in eight Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

Educate Arkansans in safe, sound and effective methods to minimize the detrimental effects of fire ants in residential, agricultural, public and industrial areas.

Output Indicators

- Educational publications (including some multi - state) and materials produced including videos, CD Roms, slide sets necessary to conduct the statewide fire ant educational program
- Educational meetings and seminars held to inform homeowners, grower groups, community leaders and elected officials, and specialized groups about imported fire ant biology, impact and management
 - Fire ant educational programs in public schools
 - Fire ant abatement demonstrations in residential, agricultural, public and industrial areas
 - Number of TV, radio and internet programs to increase fire ant awareness
 - Number of people attending educational meetings, programs and seminars

Outcome Indicators

- Number of new and continued fire ant abatement programs in Arkansas
- Increased fire ant awareness
- Modification of fire ant management techniques

Key Components

Fire Ant Education includes (but is not limited to) biology, fire ant IPM, environmental protection, pesticide labeling, management demonstrations, worker protection, economics of fire ant management to specific grower groups, economic impacts and organized abatement.

Internal and External Linkages

Internal:

- Agricultural Experiment Station
- University of Arkansas - Fayetteville and Monticello

External:

- Arkansas State Plant Board
- Arkansas Pest Control Association
- Specialized Grower/Interest Groups - Cattleman's, Nurseryman's, Farm Bureau, etc.
- USDA Fire Ant Research Lab
- National Resource Conservation Service
- County and City governments
- County Conservation Districts
- Professional Organizations

Target Audiences

- Homeowners
- Community leaders and elected officials
- Professional pest controllers
- Farmers
- Gardeners and Landscapers
- Children and youth

Program Duration

Intermediate (1-5 years)

Allocated Resources

- Total: 5.84 FTE, \$543,611; Federal (3b&c) - \$82,878
- Integrated: \$12,771; Projected Resources for FY2000-2004 are 2% annual increases

Education and Outreach Programs

- Annual fire ant in-service training for agents
- Special fire ant in-service training as requested by district administration

- Training of community leaders in potential fire ant impact and organized abatement
- Public meetings, demonstrations, educational programs and public service announcements in fire ant infested regions
- Operation of a worldwide website dedicated to fire ant education and with links to fire ant information and related sites in other states
- Youth outreach: Publication of fire ant coloring books, fire ant youth video and interactive

CD rom

- Regional Fire Ant Educational material such as “Fire Ant Bytes” - a CD Rom, several educational videos for use in fire ant education and abatement, and several fire ant publications including the multi-state publication “Managing Red Imported Fire Ants In Agriculture”. Aside from the regional publication, the CDrom and youth oriented material is used in other fire ant infested states.

Solid Waste Management

Statement of Issue

Arkansas generates 2.5 million tons of solid waste annually. The state has a limited number of disposal sites or landfills; (24 Class 1 landfills to serve 75 counties). Some areas of the state do not have comprehensive solid waste management collection programs. Yard trimmings are banned from landfills. Recycling goals have been set by state legislation. Improper disposal of solid waste is a health and safety problem and a detriment to economic development.

Using a discussion and priority setting process, the County Extension Councils in one-fourth of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

To educate citizens and to promote appropriate solid waste management practices.

Output Indicators

- Educational meetings, workshops, demonstrations (sites or exhibits), news articles, radio programs and tours held to educate clientele about the benefits and how-to's of composting (backyard, on-farm and municipal).
- Educational meetings, workshops, news articles, radio and TV programs, demonstrations, and tours held to educate clientele about appropriate solid waste management practices (landfilling, recycling, source reduction, reuse, household chemical disposal, pay-as-you-throw programs, and others).
- Educational meetings, workshops, news articles, radio and TV programs, demonstrations, and tours held to educate agriculture clientele about disposal and recycling and composting opportunities for on-farm generated waste (plastic irrigation pipe, pesticide containers, used motor oil).
- Educational meetings, workshops, news articles, radio and TV programs, and tours held to educate clientele about the dangers of improper solid waste disposal - illegal dumping, open burning and littering.
- Clientele attending education programs and receiving educational publication and other materials written and/or distributed on solid waste management.

Outcome Indicators

- Number of clientele who reported changing their solid waste management practices (recycling, composting, subscribing to solid waste collection services, source reduction activities, household chemical disposal events, ceasing open burning).
- Number of agriculture clientele adopting new disposal practices.
- Pounds of pesticide containers and plastic irrigation pipe collected for recycling.
- Number of illegal dumps identified and closed.
- Number of cleanup events and participation.
- Number of groups participating in adopting streets, parks, highways, streams and similar cleanup programs.

Key Components

Solid waste management education may include but not be limited to composting, household chemical disposal, recycling, source reduction, landfilling, pay-as-you-throw programs, waste-to-energy, reuse, illegal dumping, open burning, and littering of household generated waste and on-farm generated waste.

Internal and External Linkages

Internal:

- Extension Service Faculty
- University of Arkansas College of Agriculture

External:

- Regional Solid Waste Management Districts
- Arkansas Department of Environmental Quality
- Local governments
- Arkansas Recycling Coalition
- US Environmental Protection Agency
- Other state extension programs
- Environmental organizations
- Other federal and state agencies

Target Audiences

- Adults and youth
- Agriculture producers
- Local elected officials

Program Duration

Long term - greater than five years

Allocated Resources

- Total: 2.27 FTE, \$211,301; Federal (3b&c) – \$32,215
- Integrated: \$2,818; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Home composting has been a key area of emphasis, due to the yard waste landfill ban. Programs are conducted by the specialist as requested by counties and the interest is growing. Compost training is provided for County Master Gardener Training and a video and fact sheets are available. A Master Composter Program was implemented in one county and several counties have indicated an interest in providing this educational program.
- Educational materials on the hazards of illegal dumping and littering have been developed. Lesson plans are available on the Internet for use by agents, teachers and youth leaders.
- The recycling of Low Density Polyethylene (LDPE), used in irrigation agriculture, has been a concern in Delta Counties. Though the program may be a few years away from continued and predictable viability, recycling efforts continue. County agents and specialists are exploring management options for adding value to the used materials in an effort to create a market for more than 5 million pounds of used poly tubing annually.
- County agents are working with a number of local governments and regional solid waste management authorities to provide Extension-led recycling and waste reduction education efforts for both youth and adult audiences.

Economic and Community Development and Public Policy Education

Statement of Issue

Many rural Arkansas communities are experiencing a decline in their economic base and population at the same time that urban centers are experiencing growth. Large numbers of people not in the labor force, high unemployment, and low wage jobs create a need to enhance the local economic base of these communities.

- One-third of Arkansas' 75 counties lost population between 1990 and 1997.
- Eleven percent of Arkansas' counties lost jobs between 1990 and 1996.
- The number of cooperatives in the state is declining.
- The number of government contracts and funds coming to Arkansas is small.

There is a citizen's movement in Arkansas to abolish all property taxes and restrict state and local governments in raising additional revenue to replace the lost property tax revenue.

Using a discussion and priority setting process, the County Extension Councils in two-thirds of Arkansas' counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

Arkansas' communities and rural residents will have more resources and economic opportunities to improve their quality of life.

Output Indicators

- Number of workshops, meetings, and conferences held
- Number of education publications and newsletters and other materials produced
- Number of non-formal educational meetings with clients
- Number of community studies, surveys, and assessments

Outcome Indicators

- Number of community projects undertaken
- Number of home based businesses started
- Number who report increase in home based business profits
- Number of small businesses receiving government contracts
- Number of new parks and recreation facilities constructed

Key Program Components

Topics:

Economic development strategies, retail and service sector development, cooperative education, export marketing, public policy issues education, tourism development, retiree relocation, home based business, income tax school, entrepreneurial services, government bid procurement assistance, community development projects, workforce education, and welfare reform.

Activities:

- Conferences, workshops and meetings for business and community leaders and agency personnel
- County Agent in-service training
- One-on-one meetings with entrepreneurs, business, and community leaders
- Development of curricula and educational resource material

Internal and External Linkages

Internal:

- Extension Service and Agricultural Experiment Station faculty of the University of Arkansas
 - Economic and Community Development Faculty
 - Family, Youth and 4-H Faculty
 - Entrepreneurial Services Faculty
 - School of Human Environmental Sciences Faculty
 - Department of Agricultural Economics and Agribusiness Faculty
 - Communications Faculty
- College of Agriculture, University of Arkansas at Pine Bluff (UAPB)

External:

- Arkansas Department of Parks & Tourism
- Arkansas Department of Economic Development
- Arkansas Department of Human Services
- Arkansas State Committee on Cooperatives
- UALR Arkansas Small Business Development Center
- Arkansas Science and Technology Authority
- Other state colleges, universities, and vocational technical institutes as appropriate
- Foundations and non-profit organizations as appropriate

Target Audiences

- Community Leaders (Elected officials and other community leaders)
- Entrepreneurs and Business Leaders
- Cooperative Leaders, Directors, and Members

- Welfare Program Providers
- State Legislators
- State Agency Personnel

Program Duration

Intermediate

Allocated Resources

- Total: 14.46 FTE, \$1,345,996; Federal (3b&c) – \$205,209
- Integrated: \$77,178; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **Community Leadership Clinics:** Clinics teach citizens the skills needed to lead and tackle issues facing them.
- **Take Charge:** Take Charge workshops help communities find the ways and means to make their economic pulse beat more strongly.
- **Retirement Relocation:** This program helps communities ensure they have what retirees need and explains how to recruit them.
- **Tourism:** This program helps communities plan and develop tourism opportunities.
- **Parks and Recreation:** This program helps communities develop recreation and parks facilities and the quality of life.
- **Community Surveys:** Surveys are the next best thing to mind reading. The Extension Service can help you design, conduct and assess surveys to know what's on the minds of your neighbors and make plans to help better their lives.

Leadership and Volunteer Development

Statement of Issue

The need for communities to have effective leaders and active volunteers has never been greater than today. Communities are facing new challenges, and yet the increase in two-career families has reduced the amount of time that most families have for community activities. More and more efforts are being exercised to form coalitions, to collaborate, and to network with other agencies and organizations. Individuals interested in developing their own skills and contributing to the development of their communities are vital resources to organizations. As a result of these changes, we are facing greater competition for individuals with leadership skills and time for volunteering. Leadership development training is one of the most effective ways that communities can develop a cadre of individuals who can effectively address the critical issues facing them. Furthermore, organizations that utilize volunteers most effectively, do so as a coordinated volunteer program and training is a valuable component to the success of these efforts.

Using a discussion and priority setting process, the County Extension Councils in 90 percent of Arkansas counties have identified this issue as a major emphasis for their long range education program.

Performance Goal

Leaders and volunteers will gain knowledge and develop individual and group skills to enhance their effectiveness in working in organizations and communities.

Output Indicators

- Number of training programs conducted for leaders and volunteers
- Number of individuals participating in training
- Number of new participants in leadership and volunteer programs

Outcome Indicators

- Number volunteers conducting programs as a result of training
- Number of volunteer hours contributed to programs
- Number of individuals trained reporting adoption of skills and/or utilizing knowledge gained
- Number of individuals in new leadership positions
- Number of community projects implemented

Key Program Components

Program components related to this topic include: Leadership, Leadership development, Volunteers, Community Development, Volunteer Training, Master Volunteers, Organizational Development; and Volunteer Resources.

Internal and External Linkages

Internal:

- Cooperative Extension Service Faculty
- Family, Youth 4-H Initiative Team for Leadership and Volunteer Development

External:

- Community Organizations
- Advisory Committees
- Master Volunteers
- Quorum Courts
- CES Councils
- County Leadership Programs
- 1890 Faculty
- AEHC
- 4-H Alumni Association
- 4-H Volunteer Leaders Association

Target Audiences

- Adult Volunteers
- EHC Volunteers
- 4-H Volunteers
- Master Volunteers
- Extension Council Members
- Elected Officials
- Advisory Board Members
- Community Leaders

Program Duration

Long Term

Allocated Resources

- Total: 24.45 FTE, \$2,275,906; Federal (3b&c) – \$346,981
- Integrated: \$60,484; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

Master Volunteer Training Programs: The Cooperative Extension Service University of Arkansas has developed master volunteer training programs for food preservation, shooting sports, gardening, clothing, sports fishing, and 4-H leadership. These programs provide several hours of intensive training in that field, and often include membership in an association of volunteers, plus participation in state - wide conferences each year.

Arkansas Extension Homemakers: Arkansas Extension Homemakers (AEHC) reach every county in the state, with a membership of approximately 10,500 individual family members. Through their educational programs, community service and leadership in the community, they enrich the life of the community and provide opportunities for educational outreach. AEHC has three objectives: to provide educational programs that will help improve family life; to develop leadership skills that will provide opportunities for growth individually and within the community; and to provide service to the community that helps the community in a meaningful way.

Community Voices Leadership Program: The Community Voices Leadership Program, which is a skills -based training program consisting of fourteen sessions. Training will be conducted in the counties with the support of educational resources.

Train the Trainer Leadership Development Program: The Train the Trainer Leadership Development Program which is designed for board members, officers, and emerging leaders. Training will be conducted in the counties with the support of educational resources.

VISION 2010 - Developing Healthy, Sustainable Communities for the Information: Vision 2010 is a partnership of organizations committed to assisting Arkansas communities become successful in the emerging Information Age. Participating communities form broad -based steering committees; select leadership teams to participate in seminars addressing issues from an Information Age perspective; and develop strategic plans that position their communities to realize their desired futures.

Community Leadership Clinics: Community Leadership Clinics bring people together to build a stronger leadership base for their community. They're offered in counties where there's strong interest and financial support. Clinics teach citizens the skills needed to lead and tackle issues facing them. They are made up of four to seven evening sessions and may include a project and graduation banquet.

LeadAR: LeadAR is an intensive two-year individual leadership development program that consists of 12 three-day seminars about issues affecting Arkansas; a national study tour to Washington D.C.; and an international study tour to another country. Participants set goals for community projects, learn about resources at the state and national level, and develop a strong network of contacts in class and with LeadAR alumni.

Strengthening Families

Statement of Issue

The family has changed more in the last decade than any other social institution. This has led to significant diversity in family life. It is within these changing families that the children and youth who will guide our nation in the next millennium are being nurtured. The conditions of children's lives and their future prospects is largely reflected by the well-being of their families. When families are strong, stable, and loving, children have a sound basis for becoming competent, caring and productive adults. When families are not able to give children the attention and affection they need or when families cannot provide for children's material needs, the children are far less likely to achieve their full potential.

- Each year approximately 36,000 babies are born to Arkansas families. About 20% of these infants are born to adolescent mothers. These young mothers frequently have no education and few skills for taking on their parenting responsibilities.
- 71,000 Arkansas families with children live at or below the poverty level. Lack of resources severely limits families ability to adequately care for their children.
- High quality child care is critical for optimal cognitive and social development of Arkansas children. Access to affordable, appropriate and high quality child care is difficult for many Arkansas parents. In Arkansas, 69% of the children under age 6 live in families with working parents and 32% of Arkansas children under age 13 live in working poor families.
- The use of violence as a way to resolve conflict has become a norm accepted in our society. Every week 2 Arkansas youth aged 15-17 die from violence, 13 are arrested for violent crimes and 81 are arrested for alcohol/drug related crimes. But, the concept that violence is a learned behavior provides a strong incentive to prevent the development of violent behavior at an early age through life skills and prevention education programs.

Using a discussion and priority setting process, the County Extension Councils in two-thirds of Arkansas counties have identified the need to support and strengthen families as a major emphasis for their long range educational programs. The FY4H program focuses on strengthening families by providing education in the areas of parenting, child care provider training and youth violence prevention.

Performance Goal

To strengthen Arkansas families:

- by enhancing the parenting skills of Arkansas families.
- by improving the caregiving skills of child care providers.
- by increasing pro-social behavior exhibited by Arkansas children and youth.

Output Indicators-Parenting

- number of parenting education programs provided
- number of clientele attending parenting education programs
- number of parenting educational resources developed

Output Indicators-Child Care

- total number of child care provider training sessions provided
- total number of hours of child care provider training provided
- number of child care providers who completed *The Best Care* program
- number of child care providers who participated in, but did not complete, *The Best Care* program
- number of child care providers attending child care training programs other than *The Best Care Program*
- number of child care provider training educational resources developed

Output Indicators-Violence Prevention

- number of pro-social/violence prevention educational programs offered to children and youth
- number of pro-social/violence prevention educational programs offered to adults
- number of children and youth who participated in a pro-social/violence prevention program
- number of adults who participated in pro-social/violence prevention program
- number of pro-social/violence prevention educational resources developed

Outcome Indicators-Parenting

- number of parents who report that they *plan to adopt* one or more recommended parenting practices*
- number of adolescent parents (18 years of age or younger) who report that they *plan to adopt* one or more recommended parenting practices*
- number of parents who report that they *have adopted* one or more recommended parenting practices*
- number of adolescent parents (18 years of age or younger) who report that they *have adopted* one or more recommended parenting practices
- number of parents who report that they believe they are doing a better job of parenting
- number of adolescent parents (18 years of age or younger) who report that they believe they are doing a better job of parenting

Outcome Indicators-Child Care

- number of providers who report that they *plan to adopt* one or more recommended child care practices*
- number of providers who report that they *have adopted* one or more recommended child care practices*
- number of providers who report greater satisfaction in caring for children
- number of providers who report that they believe they are doing a better job of providing appropriate, high-quality care for children

[* Recommended practices for parents and or child care providers include: using appropriate guidance/discipline techniques, communicating more frequently, communicating more positively, doing things to enhance the child's self-esteem,

setting/having developmentally appropriate expectations, providing adequate physical care, providing appropriate immunizations, providing appropriate nutrition, etc.]

Outcome Indicators- Pro-Social/Violence Prevention

- number of youth who report that they *plan to adopt* one or more recommended pro-social/violence prevention practices
- number of youth who report they *have adopted* one or more pro-social/violence prevention practices
- number of teachers, child care providers, parents, or other adults who report improved pro-social behaviors in youth who have participated in CES educational programs
- number of adults who report they *plan to adopt* one or more pro-social or non-violent recommended practices in dealing with children and youth*.
- number of adults who report they *have adopted* one or more pro-social or non-violent practices in dealing with children and youth*.

[*Recommended pro-social/violence prevention/non-violent practices include decision-making, anger management, stress management, conflict resolution, exhibiting helping behaviors, and esteem building]

Key Program Components: Activities

- Parenting education will include teaching the critical parenting practices outlined in the National Extension Parent Education Model. These practices include caring for self, understanding children, guiding, nurturing, motivating, and advocating for them. Methods will include educational meetings, school enrichment, and self-study.
- Child care provider education will include teaching recommended child care practices in the areas of foods/nutrition; business management; child guidance; and health. Methods will include training agents who will provide classroom instruction to child care providers.
- Violence prevention education may include decision-making, anger management, character education, stress management, conflict resolution, and esteem building. Methods will include school enrichment classes, and informal educational meetings with youth and adults.

Internal and External Linkages

Internal:

- CES county agents
- CES specialists in youth development, family life, health, resource management, nutrition
- CES District Teams

External:

- Division of Child Care and Early Childhood Education, Department of Human Services
- Parent Education Task Force
- Arkansas Advocates for Families & Children
- Attorney Generals Office

- Professional organizations
- Schools
- Arkansas Coalition for Juvenile Justice
- Character Counts Coalition
- Josephson Institute
- Arkansas Promise- Arkansas Dept. of Volunteerism

Target Audiences

- Limited resource parents
- Adolescent parents (18 year of age or younger)
- School age children grades K - 12
- Youth aged 5 - 19
- Child Care Providers

Program Duration

Long Term: Greater than or equal to 5 years.

Allocated Resources

- Total: 15.82 FTE, \$1,472,590; Federal (3b&c) – \$224,509
- Integrated: \$29,757; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- **Strong Families-Safe Communities:** A program targeted to limited income parents and youth in seven Arkansas counties. Utilizes one -to-one teaching methods with adults and group efforts with youth.
- **The Best Care:** A program developed to furnish child care providers throughout the state with ten classroom hours of continuing education to enhance their ability to effectively care for children as well as to maintain their state licensing credentials.
- **Violence Prevention:** A series of school enrichment programs targeting kindergarten and elementary school children. Teaches topics such as anger management, conflict resolution, problem solving and effective communication.
- **Parenting Education:** A program to help parents become more effective by learning to take better care of themselves; improve their understanding of children; and motivate, nurture and guide them.

Managing Resources

Statement of Issue

The combination of low national savings rate and high debt levels present serious economic problems for many families. Bankruptcy filings in Arkansas continue to increase. Families living on the “financial edge” – with no savings and a high debt load – find it difficult, if not impossible, to weather a financial crisis.

- Data from the 1996-98 Current Population Survey found that 75,000 (more than 20%) of the state’s 372,000 families with children live with incomes below the federal poverty line.
- The number of bankruptcy cases in Arkansas has increased each year since 1995. The total number of bankruptcy cases increased by 37% in 1995; 41% in 1996; 19% in 1997 and 9% in 1998.
- According to Teenage Research Unlimited, U. S. teens spent an estimated \$141 billion in 1998. Teen spending increased 16% between 1997 and 1998. While teens have substantial access to money, studies show that their knowledge of basic financial concepts is lacking. High School seniors responding to a 31-question multiple choice exam, designed to test basic financial survival skills, scored, on average, 57.3%. Only 10.2% of the students scored a “C” or better.

Using a discussion and priority setting process, the County Extension Councils in two-thirds of Arkansas counties have identified managing family resources as a major emphasis for their long range educational programs.

Performance Goal

Arkansans will learn to manage available resources to improve their quality of life.

Output Indicators

- number of educational meetings related to teaching resource management skills
- number of participants attending educational meetings related to resource management skills
- number of educational publications and other materials developed to educate people about resource management
- number of hours spent planning, conducting, marketing and evaluating educational programs related to resource management

Outcome Indicators

- number who reported an increase in savings
- dollar amount of increased savings reported
- number who reported a decrease in debt
- dollar amount of decreased debt reported
- number who reported increased satisfaction with their quality of life
- number who feel more confident about managing available resources
- number who reported Increased ability to pay expenses from month-to-month

- increased satisfaction with their financial well-being
- number of households who reached a financial goal

Key Program Components

Topics:

Decision making, goal setting, budgeting/spending plans, consumer strategies, credit, basic financial services, risk management and protective strategies, saving strategies, employment skills, time value of money, financial management/life skills.

Activities:

Development of educational materials and publications, leader training, seminars, workshops, short-courses, and other educational meetings, games, camps, competitive activities for youth, electronic dissemination of information

Internal and External Linkages

Internal:

- Family, Youth and 4-H Faculty
- Ag Eco Specialists
- Communications Faculty
- District Faculty
- County Faculty
- School of Human and Environmental Sciences Faculty

External:

- Human Service Agencies (Arkansas Cares, HeadStart, HIPPI, Individual Development Account groups, etc.)
- TEA Coalitions
- State and Local Workforce Boards
- Workforce Investment Act Agency
- National Endowment for Financial Education
- Jump\$tart Coalition
- Public Schools
- Educational Cooperatives
- Consumer Credit Counseling Agencies
- Employers

Target Audiences

- Limited Resource Audiences
- Adults
- Youth

Program Duration

Intermediate (1 - 5 years)

Allocated Resources

- Total: 17.21 FTE, \$1,601,977; Federal (3b&c) – \$244,235
- Integrated: \$35,802; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

- Money 2000
- High School Financial Planning Program
- Women's Financial Information Program
- Keeping It In The Family: Estate Planning Education
- Money Sense for Kids
- The Real Deal
- Consumer Judging Contest

Developing Youth

Statement of Issue

Arkansas youth face many challenges as they grow to adulthood. Today, too many children and youth are adrift, without a steady moral compass to direct their daily behavior or to plot a thoughtful and responsible course for their lives. At least some of the moral confusion that young people experience stems from the conduct and attitudes of prominent adults as well as from the cultural messages reflected in the media. Some of the confusion has roots in the behavior of parents who lack the ability or commitment to be responsible parents. Some of the confusion reflects the contradictions apparent in American society. Children and youth need clear, consistent messages about personal conduct and public responsibility.

Many factors influence why some young people have success in life and why others have a harder time. Economic circumstances, genetics, peers, family, and trauma all play a role. All children and youth experience some degree of risk, as they progress from birth to adulthood; but an increasing proportion of children are at substantially higher risk for negative outcomes. These children and youth do not have the advantages that promote optimal, healthy development of the body, mind, and spirit. Many youth do not have opportunities to experience positive stimulation for growth or nurturing support from family, friends, and community.

Research shows that we can help youth become capable, competent, responsible, caring adults if we provide them with a healthy start, caring adults, safe places, structured activities, marketable skills, the opportunity to serve, positive experiences, experiential learning, and the opportunity to develop basic life skills. We also know that the more protective factors in a young person's life, in comparison with the risk factors, makes a significant difference in the route they take to adulthood and beyond.

Using a discussion and priority setting process, the County Extension Councils in 100 percent of Arkansas counties have identified developing youth as a major emphasis for their long range educational programs. Educational programs within the FY4H program for youth are designed to provide youth with positive opportunities to learn and interact with peers and adults, provide leadership development and focus on life skills enhancement through research-based educational programs focusing on Family and Consumer Sciences, Science and Technology, Community and Economic Development, Agriculture and Natural Resources.

Performance Goals

Provide youth (aged 5 to 19) with developmentally appropriate, experientially-based opportunities to:

- acquire basic life skills
- develop social competencies and build positive relationships with adults and peers
- practice leadership skills
- provide service to their community and others

Output Indicators - General Youth Development

- number of youth enrolled in 4-H clubs
- number of youth involved in non-4-H club activities
- number of youth who participated in competitive activities
- number of youth who participated in non-competitive activities
- number of youth who participated in community service projects

Output Indicators - Basic Life Skills*

- number of educational programs held for youth that target basic life skills
 - number of youth who participated in educational programs designed to teach basic life skills
- [*Basic Life skills include: decision-making, keeping records, critical thinking, learning to learn, character, self-esteem, teamwork, self-discipline, etc.)

Output Indicators - Social Competency Life Skills*

- number of educational programs targeting social competency life skills for youth
 - number of youth who participated in educational programs designed to promote social competency life skills
 - number of educational programs designed to give youth and adults the opportunity to work together
 - number of adults working with youth in youth development programming
- [*Life skills related to social competencies include: nurturing relationships, sharing, empathy, concern for others, accepting differences, conflict resolution, social skills, cooperation, communication, etc.)

Output Indicators - Youth Leadership and Volunteer Development Life Skills*

- number of educational programs for youth focusing on youth leadership/volunteer development
 - number of youth participating in youth leadership/volunteer development programs
 - number of new youth participants in leadership and volunteer programs.
- [*Life skills related to youth leadership and volunteer development include: planning and organizing, goal setting, service learning, teamwork, contributing to group effort, responsible citizenship, etc.]

Outcome Indicators - General Youth Development

- number of youth who reported *working in* one or more educational project areas
- number of youth who reported *completing* 1 or 2 educational project areas
- number of youth who reported *completing* 3 or more educational project areas
- number of youth who reported *spending one or more hours* a week in providing service to their community or others
- number youth involved in educational programs who report they *have adopted* at least one number youth involved in educational programs who report they *have changed* one or more practices as a result of the educational program

Outcome Indicators - Basic Life Skills

- number of youth who report improved decision making skills
- number of youth who report improved record keeping skills
- number of youth who report improved communication skills

Outcome Indicators - Social Competencies

- number of youth who report improved relationships with peers
- number of youth who report improved relationships with parents
- number of youth who report improved relationships with non -parental adults
- number of youth who report improved conflict management skills

Outcome Indicators - Youth Leadership and Volunteer Development

- number of youth who report improved planning and organizing skills
- number of youth volunteers conducting educational programs
- number of volunteer hours contributed by youth to educational programs
- number of youth volunteers conducting community service programs
- number of community projects implemented by youth
- number of volunteer hours contributed by youth to community service programs
- number of youth in new volunteer leadership positions
- number of youth in new elected leadership positions

Key Program Components

Activities:

- 4-H community clubs
- special interest and project groups
- camping programs
- school enrichment programs
- school-aged child care education programs
- Competitive activities/events
- Non-competitive activities/events

Topics:

- Family and Consumer Sciences (health, nutrition, food safety, managing resources, personal relations, clothing, etc.)
- Science and Technology (woodworking, computers, energy, etc.)
- Agriculture (animal, plant, horticulture & gardening, etc.)
- Natural Resources (shooting sports, fishing sports, wildlife, conservation, etc.)
- Outdoor Education (backpacking, hiking and fitness, leadership challenge programs, other adventure based educational activities)

Internal and External Linkages

Internal:

- CES county agents
- 4-H program assistants
- CES specialists
- CES District Teams

External:

- Youth
- Volunteer Leaders
- Schools
- Extension councils,
- County 4-H Foundations/councils
- Civic groups
- Faith community
- Local government
- Arkansas 4-H Foundation

Target Audience(s)

Youth - aged 5-19, primarily K-12 grades

Program Duration

Long Term

Allocated Resources

- Total: 59.19 FTE, \$5,509,648; Federal (3b&c) - \$839,993
- Integrated: \$155,851; Projected Resources for FY2000-2004 are 2% annual increases

Education and Outreach Programs

- 4-H community club program
- County and state camping programs
- Exercising Character educational programs
- Talking With TJ conflict resolution programs
- Teen leadership programs (Ambassador program, State 4-H officer program, Teen Leader Conference, Youth Leadership Education programs, National 4-H Congress and Conference)
Outdoor Education Programs (ExCEL, High Adventure, RES-Q)
County, district and state 4-H O-Ramas
- Citizenship and leadership programs (CAPS, CWF, Kansas City Conference, club and county officers)
- Subject matter workshops

Managing Resources in Limited Resource Families (Louisiana, Mississippi, and Arkansas)

Statement of Issue

The combination of low national savings rate and high debt levels present serious economic problems for many families. Bankruptcy filings in Arkansas continue to increase. Families living on the “financial edge” – with no savings and a high debt load – find it difficult, if not impossible, to weather a financial crisis. Families with limited resources, especially those who have received public assistance and are trying to move toward self-sufficiency, are especially vulnerable.

- Data from the 1996-98 Current Population Survey found that 75,000 (more than 20%) of the state’s 372,000 families with children live with incomes below the federal poverty line.
- The majority of poor households (55%), compared to 13% of non-poor households, live with at least one of the following deprivations in any one year: eviction; utility disconnects; housing with upkeep problems; not enough food in the past 4 months; crowded housing; no refrigerator, stove or telephone.

Using a discussion and priority setting process, the County Extension Councils in two-thirds of Arkansas counties have identified managing family resources as a major emphasis for their long range educational programs.

Performance Goal

Arkansans with limited resources will learn to manage available resources to improve quality of life.

Output Indicators

- number of educational sessions conducted
- number of limited resource parents reached
- number of educational publications and other materials developed to educate limited resource audiences about resource management
- number of hours spent planning, conducting, marketing and evaluating educational programs related to resource management in limited resource families
- number of contact hours spent reaching limited resource clientele

Outcome Indicators

- number who reported an increase in savings
- dollar amount of increased savings reported
- number who reported a decrease in debt
- dollar amount of decreased debt reported
- number who reported increased satisfaction with their quality of life
- number who feel more confident about managing available resources
- number who reported increased ability to pay expenses from month-to-month

- Increased satisfaction with their financial well-being
- Number of households who reached a financial goal

Key Program Components

Topics:

Decision making, goal setting, budgeting/spending plans, consumer skills, credit, basic financial services, risk management and protective strategies, saving strategies, employment skills, financial management life skills.

Activities:

Multi-state curriculum development, multi-state in-service training, marketing and awareness campaigns, development of educational materials and publications, leader training, seminars, workshops, short-courses, and other educational meetings, games, electronic dissemination of information

Internal and External Linkages

Internal:

- Family, Youth and 4-H Faculty
- Communications Faculty
- Computer Systems Faculty
- District Faculty
- County Faculty
- School of Human and Environmental Sciences Faculty

External:

- Multi-State:
 - Mississippi State University Cooperative Extension Service
 - Louisiana State University Cooperative Extension Service
- University of Arkansas at Pine Bluff
- Human Service Agencies (Arkansas Cares, Head Start, HIPPI, Individual Development Account groups, etc.)
- TEA (Transitional Employment Assistance) Coalitions
- State and Local Workforce Boards
- Workforce Investment Act Agency
- Consumer Credit Counseling Agencies
- Employers

Target Audiences

Limited resource (working poor) families, including one- or two-parent Transitional Employment Assistance (TEA) eligible households.

Program Duration

Intermediate (1 - 5 years)

Allocated Resource

- Total: 0.5 FTE, \$46,542; Federal (3b&c) - \$7,096
- Integrated: \$2,663; Projected Resources for FY2000 - 2004 are 2% annual increases.

Education and Outreach Programs

Money & You

Stakeholder Input Process

County Extension Councils have been established in each of Arkansas' 75 counties to provide broad based input into program planning, evaluation, and support. County councils are comprised of from 12 -15 citizens chosen who represent the social, economic, cultural and ethnic diversity of the county.

Each year county councils are asked to identify local needs that might be addressed through Extension education programing and to prioritize them. The county faculty address these priorities within the confines of the resources and support available. At the end of the program year, a report of accomplishments is presented to the local extension council and to the elected and lay leadership of the county.

Data from the program prioritization process in all 75 counties are pooled and serve as the primary data base for establishing program priorities for program planning at both the county and state level. These data are also shared with the experiment station and departmental faculty for use in their planning process.

Extension also uses several other processes to gather stakeholder input. Each year Extension provides facilitators for the county-based policy development process of the Arkansas Farm Bureau Federation. The input gathered in this process provides important insight into issues of concern to the state's largest farm organization. Extension also assigns liaisons to each commodity board, to each crop promotion association, the Arkansas Cattlemen's Association, and the Arkansas Extension Homemakers' Council.

Program Review Process

The Extension directors from Arkansas and Mississippi (Dr. David Foster and Dr. Ron Brown) discussed and approved a process to be used as a merit review for the FY2000-2004 Plan of Work. A template of review questions was agreed upon to insure that the issues and goals were clear and consistent, that stakeholder input was apparent, and that the and outcome indicators were adequate.

Each director agreed to use the appropriate faculty to review program components and provide written comments and recommendations to the other state.

Draft plans of work were exchanged and reviewed. Reviewers were ask to consider: the clarity and appropriateness of the issue statement, the considerations of stakeholder input in the framing of the issue statement, the programmatic goals, output indicators, outcomes, the appropriateness of the key program components, and internal and external linkages. Responses were sent to each state. Written comments and recommendations were taken into account and changes were made in the plans as appropriate.

Multi-State Extension Activities

Arkansas is in the process of developing agreements with several states on multi-state programs. When these negotiations are complete, an amendment to this POW will be submitted.

Integrated Research and Extension Activities

This POW includes joint research/extension efforts between the Arkansas Cooperative Extension Service and the Arkansas Agricultural Experiment Station, and joint extension education programs between the Arkansas Cooperative Extension Service and the University of Arkansas Fayetteville, the University of Arkansas Monticello, the University of Arkansas Pine Bluff, and the University of Arkansas for Medical Sciences. Collectively, the investment of extension resources in these integrated activities represents more than 25% of FY97 "B and C" formula funds received by the Arkansas Cooperative Extension Service plus 25% of the required match.

PLAN OF WORK

University of Arkansas
Division of Agriculture
AGRICULTURAL EXPERIMENT STATION

**Federal Fiscal Years
2000-2004**

**University of Arkansas, Division of Agriculture,
ARKANSAS AGRICULTURAL EXPERIMENT STATION
PLAN OF WORK**

Introduction

The Arkansas Agricultural Experiment Station (AAES) is part of the Division of Agriculture, University of Arkansas which also includes the Cooperative Extension Service. This plan of work is a comprehensive program plan of research activities over the next five years. Although the Experiment Station and Extension Service are fully integrated within the Division of Agriculture separate plans have been developed but submitted jointly.

Program plans have been divided into 10 program areas under the five national goals and reflect the broad, comprehensive nature of our total research activity. Several program areas have been subdivided for ease of reporting. Fiscal and human resource reporting is based on 1998 baseline projections established from our last reporting period. The AAES currently is in the process of recoding all CRIS projects to correspond to the revised CRIS taxonomy. Because our baseline projections are based on the previous taxonomy and our revisions are not yet complete, all projections are based on the old taxonomy for purposes of this report. All fiscal and human resources commitments will be revised in FFY 2000 based on the revised taxonomy.

The Dale Bumpers College of Agricultural, Food and Life Sciences and Arkansas Agricultural Experiment Station are in the process of developing a second five year strategic management plan. The program areas identified in this report will be utilized in this annual planning effort to facilitate future plan of work reporting and updates.

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**ARKANSAS AGRICULTURAL EXPERIMENT STATION RESEARCH
PROGRAM AREAS**

GOAL 1. An agricultural production system that is highly competitive in the global economy.

Program Area 1. Sustainable plant and animal production systems.

Plant systems
Animal systems
Poultry systems

Program Area 2. Plant and animal germplasm and genetic improvement.

Plant improvement
Animal improvement
Poultry improvement

Program Area 3. Plant protection.

Program Area 4. Animal health.

Livestock
Poultry

Program Area 5. Agricultural economics and agribusiness.

Program Area 6. Product development, processing and engineering.

GOAL 2. A safe and secure food and fiber system.

Program Area 7. Food safety.

GOAL 3. A healthy, well nourished population.

Program Area 8. Human nutrition.

GOAL 4. Greater harmony between agriculture and the environment.

Program Area 9. Forest, soil, water and wildlife conservation and management.

GOAL 5. Enhanced economic opportunity and quality of life for Americans.

Program Area 10. Improved quality of life and community development.

GOAL 1. An agricultural production system that is highly competitive in the global economy.

Program Area 1. Sustainable plant and animal production systems - Plant systems.

Issue Statement:

Arkansas ranks as one of the primary agricultural states in the nation. Row crops are grown on over six million acres of farm land and, along with forestry, contribute over \$3 billion to the state's economy annually. Arkansas is the largest producer of rice in the nation and is a major producer of soybeans, cotton, and soft red winter wheat. Although small in size, fruits and vegetables are a significant and growing industry. Turf, ornamentals and landscape plants are the fastest growing segment of the agricultural industry nationally. Although relatively undeveloped, the favorable climate, expanding tourist industry, presence of major retailers, need for alternative crop enterprises and focus on rural development make this area a significant opportunity for economic development. Both large and small farms continue to be an important part of the state's economy.

The phase out of commodity support payments, increased globalization of agricultural markets and consolidation of the agriculture industry have placed farmers into a higher risk environment that is increasingly technology and market driven. Farmers must rapidly adapt to this changing environment. More than ever before, research must rapidly integrate new knowledge into production systems that maximize profits without impacting our natural resources. Integration of knowledge developed from a diversity of disciplines into improved production systems remains an important challenge.

As structural changes occur in row crop agriculture, research will be needed to ensure that alternative production systems are developed which minimize risk and uncertainty and that information is provided to assist producers and policymakers during this time of fundamental change.

Goals:

Develop crop and forest production systems that are sustainable, profitable and competitive in the global marketplace.

Output Indicators:

Develop improved crop production systems that maximize profitability and sustainability.
Develop new technologies that will enhance existing crop production systems.

Develop new knowledge in basic plant science and integrate this knowledge into the development of improved production systems.

Develop new green industry products and technologies.

Outcome Indicators:

Demonstrate improvement in crop yield or farm profitability that is linked to the development and introduction of new research information.

Demonstrate the improved integration of disciplinary knowledge into whole farm cropping systems.

Development of new green industry production and service industries.

Key Program Components:

Multi-disciplinary research/extension crop production teams will be used to develop and integrate new knowledge into improved crop production systems. Production systems will be linked to resource management, profitability and improved product quality to ensure competitiveness. A strong economic component will be added to the multi-disciplinary efforts that focuses on farm profitability. Through biotechnology, basic research knowledge in plant biology will be moved rapidly into the development of new crop varieties with input or output characters that impact production practices or address key production constraints. Research efforts will be enhanced that address green industry technologies and market opportunities.

Linkages:

A strong research/extension collaboration exists through multi-disciplinary crop production teams and joint appointments. An annual program planning meeting of all row crop research and extension faculty that addresses stakeholder priorities and emerging research needs ensures program coordination and responsiveness to stakeholder needs. Faculty positions added in cropping systems serve a key role in coordinating multi-disciplinary research/extension teams and integrating new knowledge into improved cropping systems. New public crop varieties are released only after development of a management package for the crop that addresses fertility, pest management and other crop management needs.

AES scientists participate in four regional projects and eight IEGs in this program area. A coordinated research program on rice production systems is under development in collaboration with Texas and Louisiana. A regional task force with representation from Arkansas, Louisiana, Mississippi and Texas has been charged to study the research investment in rice across the southern region and impact of research on the rice industry. Development of canola as a potential alternative crop is conducted in collaboration with Georgia, Kansas, Tennessee, Louisiana and Mississippi.

The Forest Resources Center maintains a close collaboration with the USDA Forest Service with Forest Service personnel co-located with center faculty at the University of Arkansas - Monticello. Forestry faculty work in close partnership with the commercial forest industry, state forest commission and private landowners to address priority needs.

Target Audience:

Farmers
 Ornamental and turf industry
 Homeowners
 Forest industry

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 42 CRIS projects in this program area that address specific priority research needs.

Program Area 1. Sustainable plant and animal production systems - Plant systems.

	1998	2000	2001	2002	2003	2004
Fiscal	6,295,393	6,678,782	6,879,146	7,085,520	7,298,086	7,517,028
SY	19.8	19.8	19.8	19.8	19.8	19.8
FTE	83.4	83.4	83.4	83.4	83.4	83.4

Program Area 1. Sustainable plant and animal production systems - Livestock systems.**Issue Statement:**

The beef, pork, dairy and poultry industries are closely linked in Arkansas. The forage-based beef industry relies heavily on use of poultry litter as a fertilizer source and occasional feed source. In return, the poultry industry must have a large livestock and forage industry to utilize the litter. The size of the pork industry continues to increase. The number of operations continue to decline with an increase in size of the remaining producers. Numerous small beef, swine and dairy operations remain, creating challenges to ensure that research is size-neutral and that the needs of small under-represented and under-served producers are being addressed. Waste management must be addressed from the standpoints of both reductions of problem nutrients and improved utilization of animal waste.

A sustainable, profitable beef industry in Arkansas must have production systems that rely on homegrown forages and add as much value as possible to the cattle raised in the state. Structural changes in both livestock and crop agriculture create a critical need to develop production systems that integrate beef cattle production with traditional row crops such as wheat and soybeans.

The dairy industry continues to decline in Arkansas but requires continued support to maximize production efficiency. The experiment station no longer maintains a research dairy but retains a focus on dairy forage research.

Goals:

To improve the profitability and sustainability of livestock in Arkansas.

Output Indicators:

Provide needed research into forage systems, which produce year-round nutrition for beef cattle with greatly reduced inputs of machinery, purchased fertilizer and chemicals.
Develop production systems using combinations of traditional row crops such as wheat and soybeans with beef cattle on the same acreage.

Develop new forages and forage systems to reduce input costs to dairies.

Provide needed research into systems that produce cattle ready for shipment to the feedlot rather than production of lightweight calves.

Outcome Indicators:

Demonstrate improved profitability of Arkansas agriculture from integrated production systems utilizing livestock and crops.

Demonstrate improved beef and dairy production efficiency through adoption of new forage system models.

Demonstrate improved swine production systems that improve efficiency and minimize environmental impacts.

Key Program Components:

The animal science program maintains a focus on beef and dairy forage systems, beef and swine reproduction, and beef and swine nutrition. Research capacity has been added in meats and forages. Beef production research focuses on adding value through the stocker and feeder phases. Forage, beef and integrated crop systems research is conducted at three sites representing the major climate and soil types in the state to develop alternative livestock-cropping systems.

Linkages:

Extension and research programs are closely linked through split appointments and joint program planning activities. Numerous direct research collaborations are maintained between poultry science and animal science faculty. A multi-disciplinary team addresses fescue toxicosis in collaboration with the University of Missouri, Oregon State and USDA, ARS. Faculty participate in two regional projects and two IEGs involving forage systems, beef cattle reproduction, and swine production. Joint research planning is underway with Oklahoma State University. Direct collaborations are under development with Mississippi State and Missouri in dairy science.

Target Audience:

Livestock producers

Beef and pork industry

Program Duration:

Long term but with short term goals addressed by CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 13 CRIS projects that address specific priority research needs.

Program Area 1. Sustainable plant and animal production systems - Livestock Systems.

	1998	2000	2001	2002	2003	2004
Fiscal	2,932,637	3,111,235	3,204,572	3,300,709	3,399,730	3,501,722
SY	5.8	5.8	5.8	5.8	5.8	5.8
FTE	37.9	37.9	37.9	37.9	37.9	37.9

Program Area 1. Sustainable plant and animal production systems – Poultry systems.

Issue Statement:

Arkansas is the leading state in the US in terms of overall poultry production output and has several companies with large international export components. The world poultry industry is very dynamic and changes that occur in production systems in one area of the world can have dramatic effects throughout the industry. Trade restrictions from the EU based on a) issues of public health with regard to the use of antibiotics in feed, and b) housing conditions of poultry with regard to animal welfare and environmental impact are just a few examples. As urban areas continue to encroach on animal agriculture, changes in production practices are often mandated through legislation. Major advances in poultry production efficiency during the past 30 years were made primarily through improvements in genetics, nutrition, and mechanization. Continued increases in production efficiency are not likely to occur at the same rate without parallel increases in the scientific knowledge base associated with these improvements. Improvements in production efficiency will be facilitated to a great extent by increased understanding of basic poultry biology and genetics. Selection pressure placed on genetic stock by commercial breeding companies provide an ever moving target with regard to basic biology, nutrition, health, and management of commercial poultry. These same improvements in genetics, nutrition and management have resulted in the development and identification of entirely new physiological syndromes and metabolic disorders that limit the ability of poultry achieve their true genetic potential.

Given the importance of the poultry industry to the economy of Arkansas, a strong research base in poultry biology as it relates to poultry production is required to help give the industry a competitive edge in the world economy. A wide range of research activities would include those directed toward understanding of basic poultry biology from cell to whole animal, from embryo to mature adults, on intermediary metabolism, as well as research on management practices of practical and immediate importance to the poultry industry.

The Center of Excellence for Poultry Science was established in response to both state wide and regional needs of the poultry industry to help solve immediate problems of the industry as well as to provide information that will help solve problems that will arise in the future. This center draws upon expertise in a) basic biology that includes immunology, physiology, molecular biology, and genetics, b) nutrition, including practical and basic, c) disease (Program Area 4 - Animal Health). There are also faculty within the Center umbrella from Agricultural Economics and Agribusiness, Biological Sciences, Entomology, Food Science, Biological and Agricultural Engineering, and Agronomy to help address a wide breadth of issues pertinent to the Arkansas Poultry and Allied Industries.

Goals:

To provide pertinent basic and practical information on poultry biology and production through an increased knowledge base in the areas of poultry genetics, nutrition, and physiology that will help the Arkansas and U.S. Poultry Industries remain competitive in the global market place.

Output Indicators:

Improve production efficiency in growth, reproduction, and management of poultry by understanding the biological basis for metabolic diseases, greater understanding of bone and muscle metabolism and removal of undesirable or limiting traits from the genetic stock.

Improve nutritional management of poultry through increased understanding of intermediary metabolism, practical nutritional management, and of gastro-intestinal physiology.

Improve reproductive performance of genetic stock through increased understanding of biology of egg and semen production.

Outcome Indicators:

Demonstrate a measurable improvement in the economic efficiency in the poultry industries important to the Arkansas and U.S. economy.

Demonstrate improvement in the genetic performance of poultry breeder birds,

Demonstrate improvement in production and nutritional efficiency of broilers and turkeys.

Key Program Components:

A focus on understanding basic avian biology related to increasing the knowledge base of growth, health, reproduction and management as well as the impact of a coordination of disciplines in the areas of biological and agricultural engineering, economics, food science and agronomy will remain a major thrust of research efforts at the University of Arkansas. A multi-disciplinary approach exists in most research programs within the center that helps achieve the goal of providing pertinent information to the poultry industry. This information is important in the state regional, national and international arenas. Physical attributes of the Center of Excellence for Poultry Science that are key to programmatic success include the Central Analytical Laboratory and the Cell Isolation and Characterization Center, the Poultry Science Feed Mill, Poultry Research Farms, Poultry Health Laboratory, and Pilot Processing Plant.

Linkages:

Arkansas will continue regional multi-disciplinary efforts in collaboration with various departments and colleges on the University of Arkansas campus as well as with many different universities. AES scientists participate in three regional projects in this program area. Close linkages also exist with USDA-ARS in many program areas as well as with ARS scientists co-located with university scientists in the Center of Excellence for Poultry Science. Numerous research collaborations exist between Center faculty and members in the Poultry and Allied Industries. The Center of Excellence for Poultry Science has close ties with industry committees that help facilitate communication to and from the industry that include the Arkansas Poultry Improvement Committee, Arkansas Feed Manufacturers Association, and the Technical Advisory Committee.

Target Audience:

Poultry and Allied Industries
 Legislative and Regulatory Agencies
 General Public

Program Duration:

Long term but with short term goals addressed by CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 10 CRIS projects that address specific priority research needs.

Program Area 1. Sustainable plant and animal production systems - Poultry.

	1998	2000	2001	2002	2003	2004
Fiscal	2,465,290	2,615,426	2,693,889	2,774,706	2,857,947	2,943,685
SY	4.2	4.2	4.2	4.2	4.2	4.2
FTE	42.2	42.2	42.2	42.2	42.2	42.2

Program Area 2. Plant and animal germplasm and genetic improvement - Plant improvement.**Issue Statement:**

Plant variety development and genetic improvement is undergoing a period of rapid transition as a result of changes in the laws governing patenting of life forms and the revolution in plant biotechnology. These changes have led to the consolidation of the seed industry and vertical integration of agricultural enterprises that combine plant breeding, biotechnology and agrichemical development. With most major crops, private programs now dominate the market for new crop varieties rather than

public programs. Public programs have had to evaluate their appropriate future role in plant breeding and genetics.

Like most institutions, the University of Arkansas has had to make rapid adjustments to this changing environment. Communication with our stakeholders has been critical to our decision to continue our development of public varieties of our major row crops and those fruits and vegetables where we play an important regional role. At the same time, we continue to develop working relationships with the private sector in order to incorporate patented technology into locally adapted varieties and to provide access to public germplasm if it is in the best interests of our stakeholders. Additional research capacity in plant biotechnology has been added in selected research areas of strategic importance to Arkansas. As the major rice producing state in the nation, we will focus our plant biotechnology efforts primarily on rice functional genomics in collaboration with the USDA Rice Germplasm Center.

Advances in biotechnology and an improved understanding of the role of diet and nutrition in human health has provided the opportunity to link expertise in plant breeding and genetics with food science, nutrition and medicine to develop new crop varieties with improved nutritional content or as biological factories to produce compounds useful in medicine or for industrial uses. Arkansas produces a number of crop plants rich in antioxidants and other compounds important to human health and a multi-disciplinary program in functional foods has been initiated.

Goals:

To continue to provide low-cost public crop varieties of the major row crops and selected fruits and vegetables, to develop germplasm of major species of importance to the region and to conduct basic research in plant genetics that will lead to improved crop varieties.

Output Indicators:

Conduct basic research in selected areas of plant genetics that will led to the development of new technology.

Develop new plant germplasm with enhanced genetic characteristics and increased genetic diversity that can be utilized by other public breeding programs or licensed to private industry.

Develop new crop varieties and release them through the most appropriate channels to best serve our stakeholders.

Build multi-disciplinary teams to develop crop varieties with enhanced nutritional value, improved processing characteristics, or containing compounds with medical or industrial uses.

Outcome Indicators:

Release new varieties of crop plants with improved yield and pest resistance on a continual basis.

Develop and release new crop varieties with improved nutritional value or improved functional properties.

Release new plant germplasm with improved characteristics for use by the public and private sectors.

Develop a recognized program in rice functional genomics in collaboration with USDA and selected land grant institutions.

Develop new basic plant technology in selected program areas in collaboration with the applied breeding programs.

Key Program Components:

Plant breeding and genetic research will continue to focus on development of improved varieties of crops of importance to Arkansas and the region, development of improved germplasm and basic research into functional genomics particularly in rice. Development and release of public crop varieties that allow farmers to save seed provide a low-cost alternative important to small and under-served farmers during this period of change. A new research focus is under development in nutraceuticals and functional foods that will link breeding programs with expertise in food science, food engineering, nutrition and medicine to address food quality issues.

Linkages:

Our plant breeding programs are in a state of fundamental change as we adapt to the rapid evolution occurring in the industry. Communication and common purpose with our stakeholders and commodity boards has been an important element in our change. Linkages with other institutions regionally and nationally is an important element. AAES scientists participate in four regional projects and three IEGs in this area. We have committed ourselves to assuming an appropriate role in rice genomics in collaboration with USDA and several other institutions. A strong linkage exists between the rice breeding program and USDA Rice Germplasm Center co-located with AES scientists at the Rice Research Center.

We have committed to the development of a program in functional foods in collaboration with the USDA Children's Nutrition Center and the medical campus. Potential collaborative linkages have been explored with the Fruit and Vegetable Improvement Center, Texas A&M. A multi-disciplinary team has been formed to bring together expertise in breeding, food science, plant chemistry and engineering to address functional foods and to develop a focused research effort in this area.

Most breeding programs are formally linked to other public programs regionally through joint regional evaluation nurseries. More formal linkages and enhanced collaborations are under development in rice and cotton.

Target Audience:

Farmers
Food industry
Consumers

Program duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 20 CRIS projects in this program that address specific priority research needs.

Program Area 2. Plant and animal germplasm and genetic improvement - Plant Systems.

	1998	2000	2001	2002	2003	2004
Fiscal	3,859,311	4,094,343	4,217,173	4,343,689	4,473,999	4,608,219
SY	5.7	5.7	5.7	5.7	5.7	5.7
FTE	60.9	60.9	60.9	60.9	60.9	60.9

Program Area 2. Animal germplasm and genetic improvement - Animal improvement.

Issue Statement:

Technology has changed the pace at which genetic improvement can be achieved. Specifically, computing power and development of large databases coupled with the ability to identify genetic markers for specific traits have changed the scope of animal breeding. At the same time, demands for consistent products and efficient production have forced the livestock industry to increase the utilization of this capability.

Goals:

To improve the quality, consistency and profitability of livestock production in Arkansas.

Output Indicators:

Identify and utilize industry databases in swine, beef and dairy production to quantify genetic traits that can be improved.

Identify and develop markers that can improve productivity through improvement of meat quality, identification of animals resistant to diseases and environmental toxins.

Outcome Indicators:

Identify through markers, cattle that may be resistant to disease-causing agents and pests.

Improve the accuracy of selection for traits affecting product efficiency, quality and consistency.

Key Program Components:

This area of research must involve data sets with greater numbers than can be achieved only from Station livestock. Large databases from large entities within the swine industry and the dairy industry are essential and are being utilized in genetic studies. Marker research involves cooperation between the genetic researchers and scientists working on mechanisms controlling fescue toxicosis.

Linkages:

Close linkages have been developed between scientists within the Station and geneticists in industry, particularly the swine industry. Cooperation with other geneticists in the southern region continues within regional projects. Cooperation between genetic scientists and researchers in physiology are keys to success in identifying and developing markers to select animals resistant to fescue toxins and other disease-causing agents.

Target Audience:

Livestock producers
Beef and pork industry

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains two CRIS projects in the program area.

Program Area 2. Animal germplasm and genetic improvement - Animal improvement.

	1998	2000	2001	2002	2003	2004
Fiscal	441,552	468,443	482,496	496,971	511,880	527,236
SY	2.1	2.1	2.1	2.1	2.1	2.1
FTE	7.1	7.1	7.1	7.1	7.1	7.1

GOAL 1. An agricultural production system that is highly competitive in the global economy.

Program Area 2. Plant and animal germplasm and genetic improvement - Poultry improvement.

Issue Statement:

A great amount of the success achieved by the poultry industry is a result of improvements in commercial poultry based to a great extent on genetic selection for performance traits in primary breeder poultry. Future improvements in poultry production and efficiency will be based not only on classical selection methods, but will rely increasingly on the use of genetic markers or marker-assisted selection in primary breeder poultry. While improvements in poultry production are made through genetic selection, consequences of intense selection pressure for production traits may result in diminished reproductive performance, co-selection of undesirable traits, and predisposition to metabolic disorders.

There is an ever-increasing demand worldwide for poultry that will not diminish in the foreseeable future. Thus, an issue of concern to poultry breeding companies is to increase the reproductive capability and efficiency in poultry breeding stock.

Given the importance of the commercial breeding companies to the success of the Arkansas poultry industry, a strong research base in genetics, as well as in programs to address issues in reproductive performance, nutrition and management of breeding stock is vital to the poultry industry. The Center of Excellence for Poultry Science has a strong commitment to address major issues associated with genetic improvement with faculty expertise in classical and molecular genetics as well as in nutrition, management and reproductive physiology. In addition, research programs in the Center also address various metabolic disorders that result from intense genetic selection.

Goals:

To provide pertinent basic and practical information on poultry genetics and reproductive physiology, and breeder management that will help the Arkansas and U.S. Poultry genetic and breeding companies remain competitive in the global market place.

To understand the biochemical and physiological basis of metabolic disorders that prevent commercial poultry from achieving their true genetic potential for production, and to use this information in the development of marker-assisted selection of poultry genetic stock.

Output Indicators:

Improve reproductive performance in poultry breeder males and females through increased understanding of biology of egg and semen production.

Develop and improve methods of marker assisted selection for use at all levels in the commercial poultry genetic companies.

Improve growth rate for poultry through removal of undesirable or limiting traits from the genetic stock.

Outcome Indicators:

Demonstrate increased reproductive and genetic performance in poultry breeder male and female stock.

Demonstrate improvement in performance of poultry for selected traits through the utilization of marker assisted selection.

Key Program Components:

A focus on understanding basic avian genetics and biology, especially those issues related to poultry genetics and poultry breeder genetics and reproductive performance will remain a major focus of research efforts in the Center of Excellence for Poultry Science. A multi-disciplinary approach exists in several programs within the center that includes cooperative projects with several local breeding companies. This information is important in the state regional, national and international arenas.

Linkages:

Arkansas will continue regional multi-disciplinary research efforts in collaboration with many Departments and colleges on campus as well as with many different universities. Such collaborations are facilitated by participation of faculty in two regional research projects. Close linkages also exist with USDA-ARS in many program areas, such as the Avian Genome Project at Michigan State University. Numerous research collaborations exist between Center faculty and several breeding companies in Arkansas as well as in the United States. The Arkansas Poultry Improvement and Technical Advisory Committees facilitate industry oversight and communication.

Target Audience:

Poultry and Allied Industries

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains two CRIS projects in this area.

Program Area 2. Plant and animal germplasm and genetic improvement - Poultry.

	1998	2000	2001	2002	2003	2004
Fiscal	151,208	160,416	165,229	170,185	175,291	180,550
SY	0.3	0.3	0.3	0.3	0.3	0.3
FTE	2.0	2.0	2.0	2.0	2.0	2.0

Program Area 3. Crop protection.**Issue Statement:**

Insects, diseases, weeds and other pest problems continue to impact crop production systems, forests, urban landscapes and turf. Pest control remains a major contributor to input costs and reduces overall profits. The loss of many traditional low cost crop protection chemicals without replacement by effective alternatives limits available management options. The advent of new limitations to meet the requirements of the Food Quality Protection Act will limit crop protection options further. New discoveries from research on host plant resistance and pest biology continue to provide alternatives but must be integrated into our crop production systems. Significant work remains to be done to minimize losses from pests, diseases and weeds in all major crop commodities of importance to Arkansas.

Goals:

To reduce the impact of major pests on crop production systems, forests and urban landscapes in Arkansas.

Output Indicators:

Increase the knowledge base on major pests, diseases and weeds of importance to Arkansas.

Develop improved crop protection strategies and technologies for our major crop systems.

Integrate new knowledge in plant genomics and basic science into the development of new pest management systems.

Outcome Indicators:

Demonstrate a measurable reduction in major pest problems of importance to Arkansas.

Increase the profitability and product quality of major Arkansas commodities by reducing losses from major pest problems.

Key Program Components:

Multi-disciplinary pest management teams are utilized to address all major crop commodities and major pest problems with a focus on the most production limiting problems for each crop. A major focus on the development of biologically-based pest management strategies that result in reduced chemical inputs will be retained. New knowledge in crop genomics and basic crop and pest biology will be developed and utilized to develop new pest management technologies.

Linkages:

Research and extension are closely linked through multi-disciplinary pest management teams and through the use of split research/extension appointments. AES scientists participate in 13 regional projects and eight IEGs in this program area. Significant industry collaborations exist in the area of crop protection chemical evaluations and variety evaluations for disease and insect resistance.

Target Audience:

Farmers
Food industry
Forest industry
Turf industry
Homeowners

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 54 CRIS projects within this program that address specific priority pest

problems or the development of plant protection technologies.

Program Area 3. Crop Protection.

	1998	2000	2001	2002	2003	2004
Fiscal	7,025,144	7,452,975	7,676,565	7,906,861	8,144,067	8,388,389
SY	24.4	24.4	24.4	24.4	24.4	24.4
FTE	91.7	91.7	91.7	91.7	91.7	91.7

Program Area 4. Animal health - Livestock.

Issue Statement:

In addition to the traditional concerns about health of beef cows, the transition of the Arkansas cattle industry to retained ownership past weaning through the stocker phase and the emergence of a dedicated stocker industry has posed new animal health challenges for the state's producers. Management of newly received and stressed calves is a critical factor. Rearing of swine in total confinement has been and continues to pose unique challenges to maintenance of health and product safety. Emphasis on reducing disease through improved stress management, better facility design and better nutritional management is critical in reducing the use of antibiotics and other invasive management techniques.

Goals:

To improve the health of livestock and poultry and ensure a safe product to the consumer.

Output Indicators:

Reduce the use of antibiotics through better diagnosis of disease.

Reduce the incidence of disease among shipping and weaning-stressed calves through better nutritional programs.

Develop management systems for beef, dairy and swine production that include better designed facilities, nutritional programs, preventive vaccination programs, stress management and disease diagnosis.

Develop optimal parasite control systems for cattle in Arkansas.

Outcome Indicators:

The demonstrated use of more effective, economical, and safer systems for handling livestock that rely more on prevention and less on treatment.

Demonstrated increase in profitability of livestock enterprises in Arkansas from reduced losses due to disease and parasites.

Demonstrated improved consumer confidence that meat and milk have been produced in safe, responsible, and approved management systems.

Key Program Components:

Major efforts continue to focus on the role of diet and management on stress and disease. New facilities for conducting detailed studies in stressed cattle management along with new laboratory facilities for conducting microbiology research have provided improved research capacity. Likewise, new facilities to conduct swine health research have permitted detailed studies with vaccines, nutritional treatments and other technologies to reduce disease losses.

Linkages:

Linkages between scientists at the University of Arkansas, Oklahoma State University and New Mexico State University have permitted studies following cattle raised or stockered in Arkansas through feedlot research facilities in the other states. AAES scientists participate in one regional project in this area.

Target Audience:

Livestock producers
Consumers
Beef and pork industry

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains 8 CRIS projects in this area that address specific priority research needs.

Program Area 4. Animal health - Livestock.

	1998	2000	2001	2002	2003	2004
Fiscal	895,014	949,521	978,006	1,007,346	1,037,567	1,068,694
SY	2.1	2.1	2.1	2.1	2.1	2.1
FTE	10.5	10.5	10.5	10.5	10.5	10.5

Program Area 4. Animal health – Poultry.

Issue Statement:

Arkansas is the leading state in the US in terms of overall poultry production output and has several companies that have emerged as major exporters of poultry products and genetic stock in the international market. These exports represent a large part of the US export volume and are impacted by the competitiveness of the world wide poultry industry. Poultry health and disease issues have become increasingly important in the negotiations of world trade and have recently been utilized as barriers to free flow of international commerce. Recent embargoes of poultry exports involving Russia, Malaysia, the Asian markets, Mexico, and the Eastern European Bloc have disrupted the economic viability of the US export markets, and also resulted in negative economic impacts in the US domestic market.

The health issues of greatest economic importance to the US Poultry Industry involve the control of parasitic infections and viral-related diseases. The research related to control of these and other economically important diseases is dependent upon greater understanding of the avian immune system in health and disease, the effects of nutrients on immune function, as well as on greater understanding of microbial and viral roles in the pathophysiology from both cellular and molecular points of view. Additional metabolic diseases can also be of considerable economic importance.

Goals:

To reduce the incidence of economically important poultry diseases and enhance poultry health through improvement in disease intervention strategies, improved vaccination programs and enhanced immune function.

Output Indicators:

Improve the diagnosis and control systems for microbiological, parasitic and viral disease agents associated with poultry including vaccine and drug intervention strategies.

Improve the understanding of the role of immune function in poultry health and disease prevention.

Improve the understanding of the biological basis of metabolic diseases in poultry to enable management and control strategy development to allow poultry to express their genetic potential for growth and reproduction.

Improve the understanding of the role of nutrients in the modulation of immune function.

Outcome Indicators:

Demonstrate improvement in diagnosis and control for microbial, viral and parasitic diseases in poultry.

Demonstrate improved understanding of nutrient modulation of immune function and the role of immunity in poultry in health and disease.

Key Program Components:

Issues related to poultry health and disease related to the poultry industry will remain a major focus of research efforts for the Center of Excellence of Poultry Science at the University of Arkansas. Multi-disciplinary research will continue on understanding basic mechanisms of health as well as those involved in pathogen infectivity and virulence from the level of the cell to the whole animal with the intent of ultimately providing practical solutions to disease prevention and management in the poultry industry. An important component for regional poultry health research and control is the poultry health laboratory on the veterinary research farm at the University of Arkansas. This facility is used for study of disease agents and mechanisms, but can also be called upon in the event of a disease outbreak in the industry to help in isolation, identification and treatment of the disease. Another key component in the Animal Health Program is the Cell Isolation and Characterization Center housed within the John W. Tyson Building. Other important physical components of the Center of Excellence that help facilitate the poultry health program are the Research Farm, the Central Analytical Lab and the Poultry Science Feed Mill (an FDA approved facility).

Linkages:

Arkansas will continue regional, multi-disciplinary research efforts in collaboration with many different universities. Faculty participate in one regional research project and one IEG in this program area. Close linkages also exist with Arkansas Livestock and Diagnostic Laboratory, with USDA-ARS in many program areas, as well as with ARS scientists co-located with university scientists in the Center of Excellence for Poultry Science. Numerous research collaborations exist between Center faculty and members in the Poultry and Allied Industries. The Arkansas Poultry Improvement and Technical Advisory Committees facilitate industry oversight and communication.

Target Audience:

Poultry and Allied Industries
Legislative and Regulatory Agencies

Program Duration:

Long term but with short term goals addressed within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains 13 CRIS projects in this program area that address specific priority

research needs.

Program Area 4. Animal health - Poultry.

	1998	2000	2001	2002	2003	2004
Fiscal	2,281,494	2,420,436	2,493,050	2,567,841	2,644,876	2,724,223
SY	5.6	5.6	5.6	5.6	5.6	5.6
FTE	28.4	28.4	28.4	28.4	28.4	28.4

Program Area 5. Agricultural economics and agribusiness.

Issue Statement:

To maintain a highly competitive agricultural production system, the U.S. and the state of Arkansas must ensure that firms operating in the industry are economically viable and efficient. One way to increase global competitiveness is through the development of new technology and product marketing. However in addition to new technologies, changes in government policies and general fluctuations in economic conditions will also affect economic performance and global competitiveness. There is a need not only for developing and evaluating new technologies that enhance competitiveness, but for an extension of the knowledge base of all factors that influence the industry's competitive position in global markets. Achieving goals of global competitiveness cannot be reliant solely on the development of new production technologies. A complete understanding of all important factors will be necessary to be successful. Factors affecting the global competitiveness of the U.S. agricultural production system include: (1) firm management decisions; (2) macroeconomic, environmental, farm, and trade policies; (3) financial markets; (4) domestic and international supply and demand conditions; (5) industry structure and organization; and (6) the development and adoption of new technologies.

The U. S. agricultural production system has evolved into an industry that is very capital intensive, increasingly dependent upon export markets and greatly influenced by government policy. The competitive situation of the agricultural production system is also affected by the performance of the distribution, processing and retailing sectors of the overall industry. Comparative advantage in global markets is determined not only by relative efficiencies in agricultural production but by the performance of the entire food and fiber system. Research projects in the areas of agricultural economics and agribusiness have and will continue to focus on extending the knowledge base in understanding these important linkages. Projects will focus on: (1) the development and economic evaluation of new technologies and products; (2) the development and analysis of government policies including trade, environmental, farm and macroeconomic policies; (3) the assessment of financial markets and their implications for credit availability for agriculture; and (4) a documentation of changes in the structure of Arkansas agriculture.

Goals:

To enhance the global competitiveness of U.S. and Arkansas agricultural production by (1) the development and identification of new technologies that enhance profitability and manage risks and (2) broadening the understanding of the linkages between policy, market conditions, industry structure and

system competitiveness.

Output Indicators:

Identify and develop new technologies and products that will enhance global competitiveness of the Arkansas agricultural production system.

Increase the research base on interactions between global competitiveness, government policy, financial markets and international supply and demand conditions.

Provide economic evaluations of select new technologies that may increase production efficiencies.

Outcome Indicators:

Provide new technologies to the Arkansas agricultural production system that results in a demonstrated enhancement of global competitiveness.

Demonstrate the impacts of trade and other policy options on the economic vitality of the agricultural production system.

Demonstrate the impacts of changes on the structure of agriculture and the financial markets on the economic performance of the Arkansas agricultural production system.

Key Program Components:

Development and evaluation of new technologies and products will remain a major focus for the research program in this area. This will involve substantial multi-disciplinary research with other scientists from agronomy, entomology, plant pathology, poultry science, food science and agricultural engineering. Policy and market analysis will also be central to the efforts for this objective.

Linkages:

Multi-disciplinary research will continue with the Department of Agricultural Economics and Agribusiness collaborating on research with scientists from a number of fields such as agronomy, entomology, plant pathology, poultry science, food science, agricultural engineering, and marketing. Arkansas will also maintain cooperation with FAPRI at University of Missouri and Iowa State University. A research collaboration exists with the University of Illinois in risk management. The global rice model serves as an international resource for the rice industry and policymakers. Arkansas scientists participate in two regional projects and six IEGs in this area.

Target Audience:

Farmers
 Industry
 Policymakers

Program Duration:

Short term goals over the five year planning period focus on evaluating new technology as it is developed within the experiment station or regionally, or to address the immediate needs of farmers, industry and policymakers. Mid-term and long term goals focus on development of new economic models and addressing major structural changes in agriculture.

Allocated resources:

The AAES currently maintains 10 CRIS projects in this program area that address specific priority research needs.

Program Area 5. Agricultural economics and agribusiness.

	1998	2000	2001	2002	2003	2004
Fiscal	1,134,716	1,203,821	1,239,935	1,277,133	1,315,447	1,354,911
SY	5.7	5.7	5.7	5.7	5.7	5.7
FTE	14.9	14.9	14.9	14.9	14.9	14.9

Program Area 6. Product development, processing, and engineering.**Issue Statement:**

The food processing industry contributes nearly \$14 billion to the Arkansas economy, but the potential for expansion of this industry is tremendous. Research on post-harvest processing, product development and quality evaluation contributes directly to the expansion of existing enterprises, the development of new value-added foods from Arkansas raw product and the development of new food processing firms. In response to the expanding needs of the food industry, additional research capacity has been added to the department of food science in food chemistry, food engineering and sensory evaluation. The program in human nutrition has been moved into food science to more closely link nutrition to product development and evaluation.

The Institute of Food Science and Engineering was established in 1996 to focus and strengthen the research and technology transfer capability of the University of Arkansas. The institute directly addresses needs of the Arkansas food industry through collaborative research with industry partners, development of training programs and through research on new value-added products utilizing Arkansas products. The institute incorporates collaborating scientists from engineering, food science, human nutrition, animal science and poultry science and brings together multi-disciplinary teams to address the needs of the food industry. Small food processing firms can utilize the pilot processing

plant and draw on scientific expertise to develop new value-added products in partnership with the institute. An expanded program in meat science has added needed capacity to address the needs of the beef and pork industry in Arkansas.

Arkansas is the leading state in the US in terms of overall poultry production and output. The per capita consumption of all meat products indicates that chicken has become the meat of choice for most American consumers in recent years. This has occurred primarily as a result of the market success that is based on affordable, high quality products being made available to the consumer that are convenient in preparation and readily available through several outlets. Many of the advances in market penetration of chicken meat products have occurred as a result of improvements in primary and further processing systems that allow for a greater volume of products to be processed more rapidly. Significant improvements in the application of mechanized systems as replacements for manual labor resulted in dramatic increases in processing efficiency. Future expansion of poultry meat product consumption will be dependent upon several factors that include a) a greater understanding of the biochemistry of the muscle and principles of muscle protein chemistry, and b) the impact of innovative further processing systems and new product development strategies on protein chemistry and structure that are particularly relevant to sensory aspects of meat products. Increased understanding of the underlying mechanisms and muscle characteristics that impact product quality and food safety attributes will be critical to future product development initiatives.

Goals:

To develop new value-added products utilizing Arkansas raw products.

To provide needed research on food and food products in partnership with the food industry.

Improve the efficiency and competitiveness of the Arkansas and U.S. food industry through improvements in processing systems, and increased understanding of food chemistry.

Output Indicators:

Improve food processing efficiency through an improved understanding of food chemistry.

Determine the impact of processing systems on product quality and food safety attributes.

Develop new food products that utilize Arkansas raw products.

Provide needed research on existing Arkansas food products that results in improved value.

Outcome Indicators:

Demonstrate the introduction of new value-added food products used by the food industry.

Demonstrate improvement in processing efficiency or product quality developed from university-based research.

Demonstrate improvement in product development strategies and impact of further processing systems on quality attributes of food products.

Key Program Components:

Research in post-harvest processing will continue to focus on rice and soybean processing, fruit and vegetable thermal and freezing operations, poultry and red meat processing and by-product utilization. An expanded sensory evaluation program focuses on rice and dairy products but is expanding in poultry and red meats. The institute will continue to provide a focus for multi-disciplinary research addressing specific needs of the food industry in partnership with an expanded food science faculty. A research focus will be maintained that addresses improvements in rice processing and product quality in collaboration with other rice research faculty and USDA, ARS scientists. The institute maintains a trained food sensory panel key to addressing product quality and consumer preferences. The human nutrition program has been moved into food science to ensure a strong research collaboration between food chemistry and nutrition. A new program thrust in functional foods has been initiated that will address the development of raw and processed foods with improved nutritional content.

Linkages:

Close collaboration with the food industry and state and federal regulatory agencies exist. The rice processing program serves as a national resource on rice quality and processing issues in collaboration with the other rice producing states, the rice industry and USDA. The Institute of Food Science and Engineering has close ties to the Ozark Food Processors to ensure that industry needs are being met. AAES scientists participate in two regional projects and two IEGs in this program area. Collaborations exist with the University of Arkansas-Pine Bluff to link research in aquaculture with expertise in food science.

Arkansas maintains a number of regional multi-disciplinary, research efforts in collaboration with many different universities in poultry. Close relationships exist between the Center for Food Processing and Engineering and the Center for Food Safety within the Institute for Food Science and Engineering. Numerous research collaborations exist between Poultry Center faculty and members in the Poultry and Allied Industries. Close linkages also exist with USDA-ARS in many program areas with USDA, ARS scientists co-located with center faculty. The Center of Excellence for Poultry Science also has close ties with industry committees that help facilitate communication to and from the industry that include the Arkansas Poultry Processors and the Technical Advisory Committees.

Target Audience:

Food industry
Poultry and Allied Industries
Legislative and Regulatory Agencies
Consumers

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains 30 CRIS projects in this program area that address specific priority research needs.

Program Area 6. Product development, processing, and engineering.

	1998	2000	2001	2002	2003	2004
Fiscal	3,801,955	4,033,494	4,154,499	4,279,134	4,407,508	4,539,733
SY	9.5	9.5	9.5	9.5	9.5	9.5
FTE	61.7	61.7	61.7	61.7	61.7	61.7

GOAL 2. A safe and secure food and fiber system.

Program Area 7. Food safety.

Issue Statement:

The U.S. has the one of the world's safest food supplies but a few highly publicized incidences of food-borne contamination and illnesses have demonstrated that improvements in food safety are still needed. Several of the more recent product recalls have included Arkansas-based companies. Despite continual improvements in food safety, food-related illnesses still account for significant public health costs and remain as a long term public health threat.

Given the importance of the food processing industry to the economy of Arkansas, a strong research base in food safety is of paramount importance. Food safety issues associated with the poultry industry and other food processing firms are of high priority. The implementation of HACCP and other food safety programs increases the need for research-based information significantly. The large investment in research infrastructure in poultry science provides one of the few locations where food safety research can be addressed from the producer through processing and product preparation.

The Center for Food Safety within the Institute of Food Science and Engineering was created to focus multi-disciplinary research on food safety issues. This center draws on expertise in microbiology, food science, engineering and other disciplines housed in several academic units to address major problems in food safety. The center brings together corporate partners and faculty members with the appropriate research expertise to address research problems of immediate need to the industry. The University of Arkansas has conducted a coordinated regional research effort with Iowa State and Kansas State as part of the Food Safety Consortium to address pressing research needs associated with the poultry, pork and beef industry. Research projects funded through the center have addressed research needs in pathogen detection, pathogen mitigation during processing and consumer safety. Arkansas also is a charter member of the National Alliance for Food Safety and serves as the administrative center for this consortium of research universities and federal partners. The Institute of Food Science and Engineering serves as an FAO Center of Excellence in food safety and provides training in food safety for FAO members.

Goals:

To reduce the incidence of food borne illnesses through improvement in pathogen detection, improved product processing and consumer education.

Output Indicators:

Improve detection systems for Listeria, Salmonella and other major food pathogens.

Increase the research base on improved food processing systems to minimize the impact of food pathogens.

Provide needed research to support educational programs in HACCP and consumer safety.

Outcome Indicators:

Demonstrate a measurable reduction in food borne diseases on food products of major importance to the Arkansas economy.

Provide improved detection systems for Listeria, Salmonella and other food pathogens to the food industry.

Provide new processing technology to the food industry that reduces the incidence of food-borne pathogens in the finished product.

Key Program Components:

Food safety issues related to the poultry industry will remain a major research effort with Listeria and Salmonella serving as key pathogens to be addressed. Research on food pathogens of fruits and vegetables will increase as opportunities permit. The Center for Food Safety will continue to be used as the focus for multi-disciplinary research in food safety.

Linkages:

Arkansas will continue the regional efforts in collaboration with Iowa State and Kansas State as part of the Food Safety Consortium and will remain as an active participant in the National Alliance for Food Safety in partnership with other major research universities and USDA, ARS. Close linkages exist with USDA, ARS in poultry food safety with ARS scientists co-located with university scientists in the Poultry Center of Excellence. AAES scientists participate in one regional project and one IEG in food safety. Numerous research collaborations exist with members of the food industry.

Target Audience:

Food industry
Consumers

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated Resources:

The AAES currently maintains 12 CRIS projects in this program area that address specific priority research needs.

Program Area 7. Food safety.

	1998	2000	2001	2002	2003	2004
Fiscal	1,590,781	1,687,660	1,738,290	1,790,438	1,844,151	1,899,476
SY	5.6	5.6	5.6	5.6	5.6	5.6
FTE	19.8	19.8	19.8	19.8	19.8	19.8

GOAL 3. A healthy, well nourished population.

Program Area 8. Human nutrition.

Issue Statement:

Five of the ten leading causes of death in the U.S. have been linked to diet and nutrition as contributing factors. Poor diet and obesity remain as common problems especially among under-served populations. The high incidence of diet related problems among the young and adolescents suggest that current efforts have not made significant impacts on reducing problems as this segment of our society begins to age. The strong social component to this area creates a particular need to link new research information with public education programs to improve human health.

Like never before, biotechnology and an improved understanding of food constituents that improve human health and nutrition will make possible the development of food products with improved nutritional value. Advances in knowledge of human nutrition can be rapidly utilized to produce improved food products. Nutritionists must be linked to multi-disciplinary teams of food scientists, biotechnologists and medical experts to address this need.

Goals:

To improve human nutrition and diet to minimize diet-related disease.

Output Indicators:

Identify health related nutritional factors that will improve human health.

Develop new food products that have improved nutritional content.

Outcome Indicators:

Produce new food products with improved nutritional content that are utilized commercially and result in improved diet and improved human health.

Demonstrate a reduction in diet related disease resulting from the utilization of university-based research.

Demonstrate a reduction in adult and juvenile obesity due to improved nutrition.

Key Program Components:

Multi-disciplinary teams of nutritionists, food scientists, natural product chemists, medical experts and biotechnologists must be utilized to address health related diet. A new program focus in functional foods is under development that will address the production of new raw and processed foods with improved nutritional content utilizing Arkansas raw products. The human nutrition program has been moved to food science to more closely link nutrition to product development.

Linkages:

A faculty working group has been formed to address human nutrition and the development of functional foods with improved nutritional value. This group links nutritionists with food scientists, plant breeders, biotechnologists, and medical scientists to address this emerging issue. A partnership has been formed with the USDA Children’s Nutrition Center and Children’s Hospital to address human nutrition, diet and disease.

Target Audience:

Food industry
 Consumers
 Medical profession

Program Duration:

Over the short term we will identify target food groups for development of foods with improved nutritional content and key food components that will be enhanced through breeding, biotechnology or improved food processing. Over the mid and long term we would expect to begin to deliver new food products with improved nutritional content. A demonstrated reduction in human diet related health problems is a long term goal.

Allocated resources:

The AAES currently maintains 6 CRIS projects in this program area that address specific priority research needs.

Program Area 8. Human nutrition.

	1998	2000	2001	2002	2003	2004
Fiscal	466,009	494,389	509,220	524,497	540,232	556,439
SY	2.2	2.2	2.2	2.2	2.2	2.2
FTE	6.2	6.2	6.2	6.2	6.2	6.2

GOAL 4. Greater harmony between agriculture and the environment.

Program Area 9. Forest, soil, water and wildlife conservation and management.

Issue Statement:

As the natural state, Arkansas has abundant natural resources. Tourism is an important and growing part of the state's economy. More than 50% of the state's land area remains forested and outdoor recreation is important to many Arkansas residents and visitors. Development of crop and animal production systems that minimize the impact on the land and water resources of the state remains a high priority.

Soil and water resources in our richest agricultural areas are degrading over time requiring increased inputs to maintain maximum productivity. Salinity and pH of some delta soils have increased due to irrigation with water of poor quality and soil organic matter content has declined due to excessive tillage. A number of Arkansas counties have been designated as critical water use areas including our most productive rice producing areas.

The size of our poultry industry has created animal waste issues that must be addressed to protect our water resources. In some areas litter production exceeds available pasture land for use as a fertilizer. Although poultry litter makes a valuable soil amendment, litter production occurs in areas distant from row crop areas that would benefit from use of the litter. Although research is addressing short term mitigation strategies, a long term approach is needed to address these issues in a comprehensive manner in partnership with state regulatory agencies and policymakers.

Goals:

To develop short term and long term solutions to address emerging soil, water and forest health problems.

Output Indicators:

Develop improved forest management practices that maintain forest health and soil, wildlife and water resources.

Develop crop production systems that improve soil health and conserve water resources.

Develop animal waste management systems that utilize animal wastes as resource assets that minimize the impact on aquatic systems.

Outcome Indicators:

Demonstrate an overall improvement in soil organic matter and tilth through adoption of improved production practices.

Demonstrate a decline in problem soils through adoption of improved production practices or use of mitigation strategies.

Show a measurable reduction in phosphorus runoff from application of poultry litter due to adoption of new management systems or mitigation strategies.

Demonstrate a decline in water demand and use of poor quality water through adoption of improved water management systems.

Key Program Components:

Programs will continue to focus on the primary problems of soil health, water quality and quantity, and animal waste management. Multi-disciplinary research teams are needed to address these complex environmental problems. Strong linkages are needed with state agencies and policymakers to provide the necessary research base to address complex natural resource issues. Industry-university coalitions must address environmental issues along with special interest groups and under-served populations.

Linkages:

Addressing long-term, complex environmental issues requires strong linkages between industry, government and special interest groups to address the problems. Strong collaborations exist with the various state agencies responsible for addressing environmental, water and wildlife issues. A research consortium has been developed with Louisiana and Texas to address water quality and water availability issues associated with the rice industry on a regional basis. Industry has worked closely with the research community to address the animal waste issue and develop industry standards and management practices. Research in animal waste is done in close collaboration with USDA, ARS scientists housed on campus as part of the poultry center. Station scientists participate in four regional projects and three IEGs addressing environmental issues.

Target Audience:

Policymakers
State agencies
Farmers
Industry
Special interest groups
Citizens

Program Duration:

Over the short term we will focus on developing mitigation strategies for major environmental issues requiring immediate attention. A long term commitment is required to address complex environmental problems in a comprehensive manner.

Allocated resources:

The AAES currently maintains 36 CRIS projects in this program area that address specific priority research needs.

Program Area 9. Forest, soil, water and wildlife conservation and management.

	1998	2000	2001	2002	2003	2004
Fiscal	4,745,361	5,034,354	5,185,384	5,340,946	5,501,174	5,666,210
SY	12.9	12.9	12.9	12.9	12.9	12.9
FTE	69.7	69.7	69.7	69.7	69.7	69.7

GOAL 5. Enhanced economic opportunity and quality of life for Americans.

Program Area 10. Improved quality of life and community development.

Issue Statement:

Arkansas remains one of the most rural states in the Union, but is undergoing rapid demographic, political and economic change. Many of the state's most rural communities, especially those most dependent upon natural resource economies, such as forest-dependent communities, struggle to gain some control over decisions that may effect their community as more responsibilities are forced upon them without new resources. Other communities find their quality of life threatened by rapid and uncontrolled growth. More than a decade of various kinds of local needs assessments have made it clear that rural communities require help in dealing with local economic development and quality of life issues. These include concerns about job development, education, youth, crime, local infrastructure, paralyzing conflict in their communities, leadership and local decision-making. Arkansas ranks 43 among the 50 states in the most recent Population Reference Bureau Kids Count assessment, showing a very low quality of life for children and youth in the state. Special concern exists for the Mississippi River Delta region, where out-migration, economic decline, and conflict have become endemic in many communities.

The experiment station has addressed a very wide variety of specific research topics dealing with quality of life and community development, including work on rural and child health care and health care in the Delta, on human migration and human capital movements in the Delta; retirement in-migration and its effects upon receiving communities; issues of aging; and recently on the human dimension of environment, natural resources, and public lands management issues. Extensive contributions have been made in the area of child care. Most of these research efforts have addressed specific quality of life or community needs.

Goals:

To enhance the economic opportunity and quality of life for all Arkansas citizens with a particular emphasis on rural communities and under-served populations.

Output Indicators:

Continue to develop, organize, and stimulate the development of quality child care services, including training events and explicit assessments and evaluations of these efforts.

Investigate home schooling and its impacts as well as other alternative modes of youth maturation.

Develop reliable data on transportation access, its impact and strategies for reducing impacts.

Work with communities and community groups and carry out investigations in cooperation with them focusing upon local, site-specific options available to these communities.

Conduct needs assessment, leadership training, and strategic planning efforts with communities.

Work with forest-dependent communities to involve them in long-range and project forest planning, and evaluate appropriate strategies for community involvement.
Provide support for and assess community level strategies for achieving common ground on issues.

Outcome Indicators:

Demonstrate improved quality and quantity of child care services in Arkansas and increased levels of achievement of subject children.

Demonstrate economic benefits to child care providers and to communities from improved child care programs.

Demonstrate the emergence of specific community-level strategies and improved support for public agencies charged with managing tourism, retirement in-migration, and other community issues.

Provide evidence of application of alternative strategies by families and institutions.

Demonstrate the use of more appropriate modes of rural transportation for the elderly.

Develop rural communities more capable of dealing effectively with the challenges facing them in response to citizen needs and aspirations.

Key Program Components:

Programs addressing quality of life and community development issues focus on addressing specific needs of communities and families in close collaboration with state and federal agencies and policymakers. Close coordination is required with extension to ensure that research studies are conducted that meet specific needs of importance and that needed information is utilized in a public outreach program or to provide needed information for policymakers. A new survey research center has been developed to facilitate research in the social sciences and to serve as a resource to policymakers, state agencies and communities.

Linkages:

Arkansas will continue existing close linkages with extension, University of Arkansas-Pine Bluff, with the USDA Forest Service, as well as with the three National Forests in the region. Close collaboration exists with the Department of Human Services and other agencies charged with child care and aging issues. Linkages with local community development organizations will be continued and expanded. Research faculty work closely with the Sociology Department and the Center for Community and Family Studies and the program in public policy. AAES scientists participate in four regional projects and two IEGs in this program area.

Target Audiences:

Families
Children
Communities

Policymakers
State agencies

Program Duration:

Long term but with short term goals set within existing CRIS projects over the five year planning period.

Allocated resources:

The AAES currently maintains 10 CRIS projects in this program area that address specific priority research needs.

Program Area 10. Improved quality of life and community development.

	1998	2000	2001	2002	2003	2004
Fiscal	849,905	901,664	928,714	956,576	985,273	1,014,831
SY	4.2	4.2	4.2	4.2	4.2	4.2
FTE	12.7	12.7	12.7	12.7	12.7	12.7

STAKEHOLDER INPUT PROCESS

Stakeholder input is derived from both formal and informal means for all program areas. Public comment on research programs are derived from county and community meetings, commodity and community associations, commodity checkoff boards, legislative committees, open public forums concerning specific issues and other sources of public input. Open public meetings, field days and county or regional production meetings provide forums for stakeholder input open to under-served or under-represented individuals, groups or organizations. Identified public comments and priorities are incorporated into the research planning process developed for each major commodity or research program area that includes both research and extension personnel. Specific priority setting activities are held with most major commodity organizations or boards at 2-3 year intervals to ensure that producer needs are being addressed. All reviews of research/extension programs include a member or members of the producer community or industry most influenced by the program area. Open public forums are held to address specific issues of importance as needed. An advisory council with broad representation is under development to assist the Dean of the College who also serves as the Associate Vice President for Agriculture-Research. This council will include representation from under-served or under-represented stakeholders.

PROGRAM REVIEW PROCESS

All Hatch, state, McEntire-Stennis, Animal Health and regional research projects receive a scientific review prior to experiment station approval and transmittal to CSREES. All research projects are reviewed by three scientists prior to submission to the respective unit head and the experiment station. Animal health funds are distributed on a proposal basis and are reviewed by a panel of associated scientists. All regional research projects receive a scientific review prior to merit review by the regional research committee.

Merit review is provided as part of our on-going program review process. The reviews may be departmental or programmatic and cut across departments. For example, the rice research and extension program was reviewed in 1998 involving research and extension across several departments. Usually two departments or programs are scheduled for review annually. These reviews and faculty-administrative focus groups feed directly into an annual planning process. Goals and outcomes developed as part of this five year planning effort will be used in future program reviews. All program reviews are conducted jointly with extension with a review team of external experts selected nationally. All review teams include at least one stakeholder representative.

MULTI-STATE RESEARCH

Currently the AAES participates in 42 regional research projects. Investment in regional research for FFY98 exceeded \$3.3 million which corresponds to 89% of federal formula funds and 8.6% of total appropriated funds from all sources. Subject to definition, all regional research is multi-state, multi-institutional and multi-disciplinary. These projects are reported in their respective program area.

INTEGRATED RESEARCH AND EXTENSION ACTIVITIES

Research and extension programs are fully integrated within the Division of Agriculture, University of Arkansas. Currently the Division of Agriculture maintains 8.4 jointly funded SY's (\$635,886) and 23.2 total shared FTE's (\$2,331,685) corresponding to 17% and 62%, respectively, of total federal formula funds in the 1998 baseline year. These shared positions ensure program integration, administration and coordinated planning.

Annual planning occurs with 1890 research to ensure program coordination and collaboration, and to prevent program duplication. Each year, the 1890 and 1862 research unit heads and selected faculty from several program areas meet with AAES and 1890 administration to discuss potential research collaborations and to share research information.