

UNIVERSITY OF ARKANSAS

Division of Agriculture

Joint Report of Accomplishments and Results 2003-2004

**Arkansas Cooperative Extension Service
Arkansas Agriculture Experiment Station**

FY2004 Report of Accomplishments

Arkansas Division of Agriculture

Executive Summary

Arkansas Cooperative Extension Service Report

Executive Summary

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

Executive Summary

Adding Value to New and Old Agricultural Products
Using Cotton Gin Waste

Agricultural Profitability

Commercial Vegetable Production

Cotton Production Education

Equipment and Techniques for Reduced Tillage and No-Tillage (Soybeans, Wheat, Cotton, Rice, Corn and Grain Sorghum)

Extension Soybean Educational and Applied Research Program

Extension Weed Science Educational and Applied Research Program

Farm Management, Marketing and Policy

Harvest Equipment Selection, Maintenance and Fine-Tuning (Corn, Cotton, Grain Sorghum, Rice, Soybeans and Wheat)

Irrigation Scheduling Program

Master Gardener Program

Multiple Inlet Rice Irrigation

Ornamental Horticulture Business Development

Ornamental Plant Evaluation

Poultry Short Course

Soil Fertility and Plant Nutrition Education and Applied Research Program

Technology Transfer and Applied Research in Feed Grains

Technology Transfer for Sustainable Rice Production

Turf, Rangeland and Pasture Weed Management

Animal Health

Poultry Disease Prevention

Animal Production Efficiency

Arkansas Beef Improvement Program

Beef Cattle Management

Dairy Cattle Management

Forage Production and Management
Horse Management
Impact of Water Quality on Poultry Production
Poultry Breeder Management Training
Poultry Hatchery Management Training
Poultry Producer Education Program

Managing Change in Agriculture
The Future of Contracts in Agriculture

Risk Management
Native American Agricultural Producers

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

Executive Summary

Food Quality
Food Processing Extension
Grain Storage and Drying to Preserve Quality with Minimal Losses

Food Safety
Food Safety Education Programs/ServSafe

Food Security
Homeland Security

Foodborne Pathogen Protection
Thermal Process Validation Workshop

HACCP
HACCP and Sanitation Training for the Poultry Industry

Goal 3 – A healthy, well-nourished population.

Executive Summary

Human Health
Reducing Risks for Chronic Disease – Physical Activity

Human Nutrition
Expanded Food and Nutrition Education Program
Food Stamp Nutrition Education (FSNE)
Healthy Weight for Arkansans

Goal 4 – Greater harmony between agriculture and the environment.

Executive Summary

Agricultural Waste Management

Animal Waste Management
Impact of Environmental Training for the Livestock Industry

Forest Resource Management

Forest Landowner Education
Urban Forest Management

Integrated Pest Management

Area-Wide Cultural Management of Plant Bugs in Cotton
Cotton Integrated Pest Management
Diversified Integrated Pest Management
Fire Ant Management
Improved Efficiency in Crop Management Through Nematode Control
Management of Stink Bug in Cotton
Pesticide Applicator Training
Plant Disease Detection and Diagnosis
Precision Chemical Applications
Rice Integrated Pest Management Program (IPM) for Arkansas
Soybean Integrated Pest Management
Urban Pest Management Program

Natural Resource Management

Forestry Continuing Education
Natural Resources Public Policy Education

Recycling

Solid Waste Management (Including Recycling and Yard Waste/Composting)

Water Quality

Water Quality and Watershed Education

Wildlife Management

Wildlife Management on Private Lands

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

Executive Summary

Child Care/Dependent Care

The Best Care: Best Care Connected

Community Development

Arkansas Procurement Assistance Center (APAC)
Economic and Community Development and Public Issues Education

Family Resource Management

Financial Security in Later Life
Planning for the Long Term

Farm Safety

Farm Safety Programs and Farm Accident Rescue Workshops

Leadership Training and Development

The LeadAR Program

Parenting

Guiding Children Successfully

Workforce Preparation – Youth and Adult

Kansas City 4-H Global Conference

Youth Development/4-H

Arkansas AG Adventures
Arkansas 4-H Tech Team
Arkansas 4-H Volunteer Core Competencies
Building 4-H Clubs
Citizenship...Washington Focus
Developing Youth
ExCEL: Experience the Challenge Experience the Leadership
4-H Responsible Environmental Stewardship-Quest (4-H RES-Q), Science Enrichment Education
for Kids (SEEK), Summer Day Camp, NatureMapping
Regional and State 4-H O-Rama
State 4-H Camp
Youth Community Service
Youth Leadership
Youth Poultry Program

Management Goals

Agricultural Communications

Mass Media Education Programs
Print Media Programs
Support Material

Information Technologies

Agriculture Decision Tools
<http://www.uaex.edu>
AIMS

Program Review

Stakeholder Input Process
Program Review Process
Evaluation of Success of Multi and Joint Activities
Integrated Research and Extension

Appendix C

Multi-State Extension Activities Form CSREES-REPT

Multi-State Extension Activities

Integrated Activities (Smith-Lever Act Funds) Form CSREES-REPT

Arkansas Agricultural Experiment Station FY2004 Report of Accomplishments

Executive Summary

Planned Programs

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

Executive Summary

Program Area 1. Sustainable Plant and Animal Production Systems

Plant Systems

Animal Systems

Production Development, Processing and Engineering

Biotechnology

Plant Production Efficiency

Agricultural Competitiveness

Plant Production Efficiency

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

Executive Summary

Food Safety

Food-Borne Protection

Food Security

Food-Borne Protection

Food-Borne Protection

Goal 3 – A healthy, well-nourished population.

Executive Summary

Nutraceuticals

Human Health

Nutraceuticals

Goal 4 – Greater harmony between agriculture and the environment.

Executive Summary

Agricultural Waste Management

Natural Resource Management

Water Quality

Forest Resource Management

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

Executive Summary

Agricultural Financial Management

Agricultural Financial Management

Children, Youth and Families at Risk

Attachments

Integrated Activities (Hatch Act Funds) CSREES-REPT

Stakeholder Input Process

Program Review Process

Evaluation of Success of Multi and Joint Activities

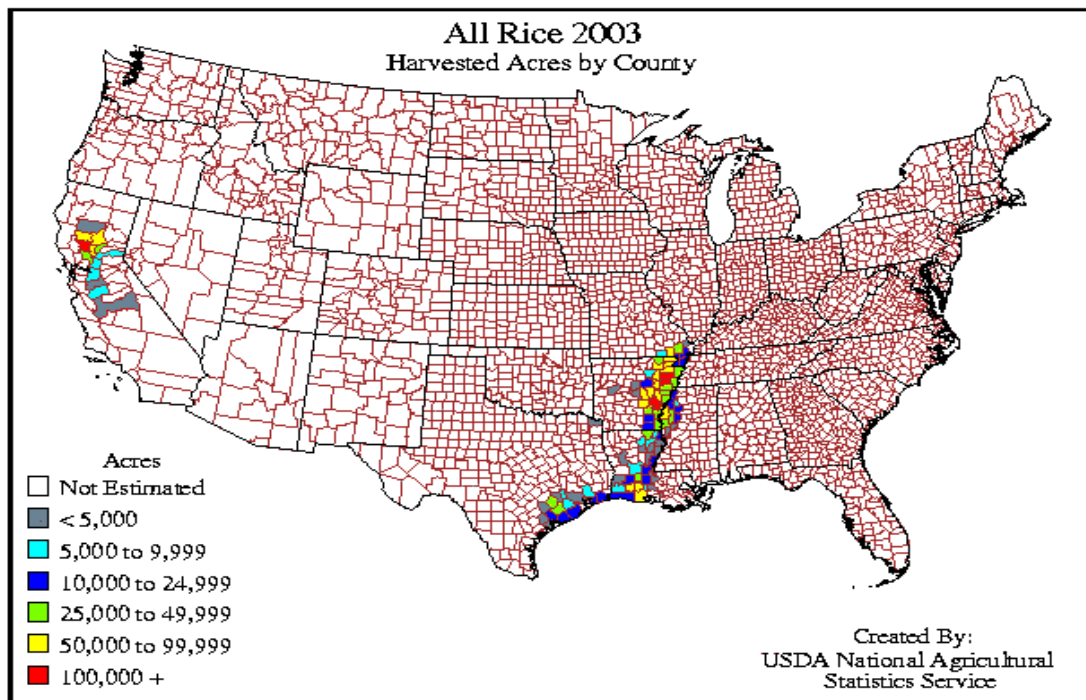
Integrated Research and Extension

Arkansas is Our Campus.

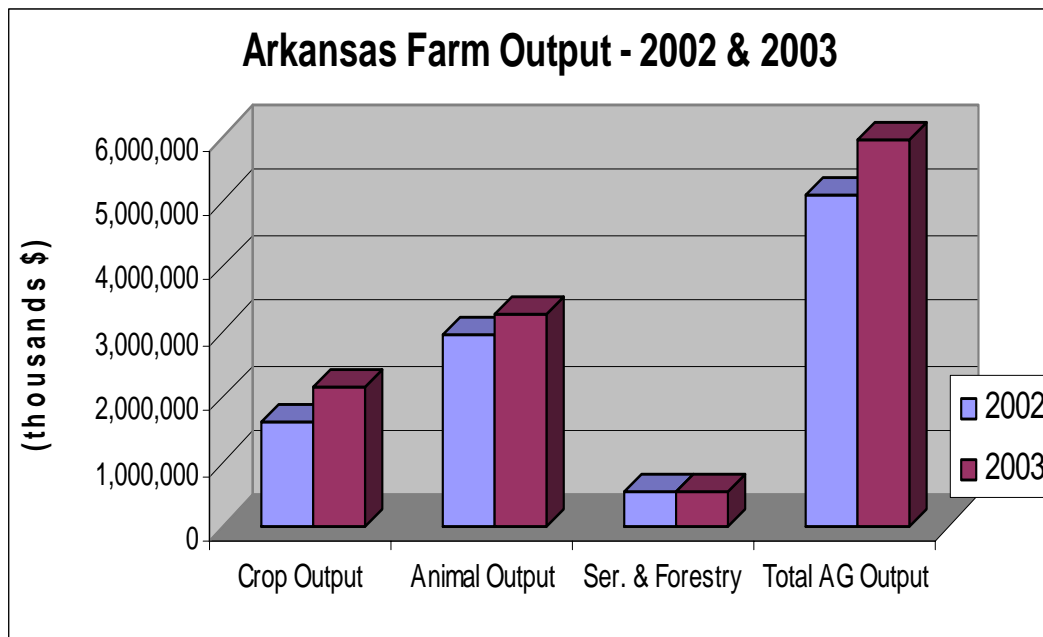
Arkansas leads the nation in the percentage of the state's economy contributed directly by agriculture. The economic impact of agriculture in Arkansas is \$13.1 billion or about 20 percent of the Gross State Product (GSP), compared to an average of 6.3 percent in the Southeast region and 4.2 percent nationwide. One in five Arkansans depend on agriculture for their livelihood. Agriculture in Arkansas accounts for 291,290 jobs.

Nearly 48,000 farms in Arkansas occupy 14.6 million acres. More than half of the state is forestland, which supports industries that are included as part of our agricultural sector. Agriculture provides the economic foundation for many communities and is a vital part of the state's economy. With its 1.555 million acres of rice, 620,000 acres of wheat, 900,000 acres of cotton, and 3.15 million acres of soybeans harvested in 2004, Arkansas produces a significant portion of field-grown food and fiber in the United States. Arkansas rice growers produce 48 percent of the United States rice production. The largest segment of livestock produced in the state is poultry and eggs which contributed over \$674 million to the economy.

Arkansas is the largest rice-producing state in the U.S., averaging 1.5 million acres per year. The Rice Research Verification Program yields averaged 171 bushels per acre, resulting in an average net return of \$178 per acre.



Farmers used the University of Arkansas Division of Agriculture Soil Testing Lab and Extension recommendations for fertilizer applications on 69 percent of the rice acreage in 2003-2004, with a record-setting average yield of 154 bushels per acre. The Cotton Verification Program (CRVP) demonstrated that variety selection can improve income per acre by an average \$100 and that proper timing of cotton harvesting returned \$50-\$75 per acre. Yields for CRVP fields averaged 1,357 pounds per acre. Arkansas state yields during the last four years have exceeded those of other mid-south states (Louisiana, Mississippi, Missouri, and Tennessee), yielding a record 1,112 pounds per acre in 2004. Savings of \$21.70 per acre was realized through insecticide cost attributed to the use of COTMAN for termination of insecticide applications. Arkansas produced a record-setting average soybean yield of 38 bushels per acre in 2004. The average yield per acre for the 2004 Soybean Research Verification Program fields was 53 bushels per acre. The Multiple Inlet Irrigation System has gained major acceptance by farmers and has demonstrated potential average water and energy saving of 25 percent and an average labor savings of approximately 30 percent. Variety selection, pest management, reduced tillage, weed control, irrigation techniques, and fertility recommendations provided by Division of Agriculture faculty made significant differences in farm profitability for 2004.



Arkansas has partnered with Louisiana State University and Mississippi State University to conduct the Master Farmer program, an environmental education program for farmers. Many landowners are unfamiliar with sustainable forest management practices, timber marketing, reforestation incentives, and other vital information. Oak sustainability after several years of drought, overcrowding, poor soils, inadequate management, insect damage, and declining vigor are severely affecting the Arkansas oak forests.

According to the U.S. Department of Health and Human Services, unhealthy eating habits, coupled with physical inactivity, is now the nation's second leading cause of death. Arkansas has one of the highest obesity rates in the United States, with 61 percent of adults being either overweight or obese. The adult diabetes rate in Arkansas is 7.9 percent – one of the highest rates in the U.S. Childhood obesity in Arkansas has likewise reached epidemic proportions. In 2004, BMI data was collected on more than 90 percent of Arkansas school children in grades K-12. Data revealed a much higher percentage of children than expected (38%) are overweight or at-risk of becoming overweight. Arkansas ranks sixth in the percentage of adults who do not participate in any physical activity. Almost 79 percent of adult Arkansans are at risk for health problems related to a lack of physical activity. Through research and consumer education on nutrition and the preparation and selection of more nutritious foods, Division of Agriculture faculty and staff enabled Arkansans to make health-promoting choices. Extension faculty delivered food and nutrition programs in all 75 Arkansas counties in 2003-2004. Nutrition program evaluation in 2003-2004 reflected that 90 percent of participants indicated they would change their eating habits and 93 percent showed improvement in at least one or more nutrition practices. One-thousand four-hundred and twenty three program participants increased their physical activity, with a total of 210,087 miles walked by Extension program participants.

Improving the economic well-being and quality of life for Arkansans and Arkansas communities is increasingly challenging in today's world. Issues such as globalization, changes in information technologies, government regulatory and fiscal policy, demographic shifts, threats of terrorism, and critical social needs all impact our society. Arkansas is a poor state. According to the 2000 Census, Arkansas ranks seventh in the nation for the highest percent of persons living in poverty. 2000 census figures reflect that Arkansas ranks 49th among the states in median household income. In a recent report by the U.S. Department of Agriculture, Arkansas was the eleventh worst state in the country in the level of food insecurity. Bankruptcy filings in Arkansas rose 32 percent between 2000 and 2003. Division of Agriculture research and extension faculty helped Arkansas citizens, businesses, and communities deal with these issues and take advantages of opportunities through the development of partnerships both within the state and through multi-state efforts. Extension 4-H and youth development programs reported 445,443 educational contacts through diverse community-based programming efforts in 2003-2004. As a result of these efforts, 7,220 youth were involved in leadership development programs, 232 Arkansas youth conducted educational programs in their local communities, 1,028 youth served in new volunteer leadership positions, and 60 youth were elected to community leadership roles. Overall volunteer development by Extension faculty resulted in 123,042.91 volunteer hours provided to Arkansas communities, at a total financial value of \$2,115,107.62 (\$17.19 per hour) to the state of Arkansas.

The Division of Agriculture is one of 14 units of the University of Arkansas System. The Division includes the Arkansas Agricultural Experiment Station (AAES) and the Cooperative Extension Service (CES). The Division has statewide faculty and staff based on three University campuses, at five regional Research and Extension Centers, seven Branch Stations and other locations. An Extension office is located in each of the 75 counties in cooperation with county governments.

The University of Arkansas Division 2003-2004 research and extension programs all relate to six objectives to:

- **Enhance Economic Opportunities for Agricultural Procedures** – Functional genomics and other research and extension programs involving plant and animal production systems relate to this objective.
- **Protect and Enhance the Nation’s Natural Resource Base and Environment** – The UA Division is helping farmers and communities deal with environmental issues. Water quality and quantity issues are the focus of extension and research programs to improve irrigation efficiency, reduce runoff of nutrients and sediment into streams, and develop alternatives to groundwater in areas where aquifers are being depleted.
- **Support Increased Economic Opportunities and Improved Quality of Life** – We support economic development and leadership development for families, youth and communities throughout Arkansas. We support the 4-H program that provides youth leadership training through 4-H clubs in virtually every community. We train future community leaders and help them plan and implement community development projects. We provide training for family childcare managers and workers and community education programs on foods and nutrition, parenting and money management, among many other topics. The Master Gardener program, which is popular among gardeners throughout Arkansas, is a Division-sponsored program involving community volunteers working with Extension faculty.
- **Improve the Nation’s Nutrition and Health** – The Division’s Institute of Food Science and Engineering promotes partnerships between food company research and development programs and our own research and extension faculty to focus on issues that directly impact the food industry and consumers. Our health and nutrition programs include extension workshops at the community level on weight control, buying food on a tight budget, and special topics such as cooking for people with diabetes. A major Division research program is focused on phytonutrients in foods such as spinach, rice bran and blueberries. These foods have antioxidants and other compounds that provide special health benefits.

- **Enhance Protection and Safety of the Nation’s Agriculture and Food Supply**
– We are a charter member of the Food Safety Consortium (FSC). Special USDA grants for the FSC fund food safety research and extension programs on poultry in Arkansas, beef in Kansas and pork in Iowa. We are developing a prototype system for treating chickens and turkeys with selected bacteriophages – naturally occurring organisms that kill harmful bacteria – to reduce levels of *Salmonella* and other pathogenic bacteria.
- **Prepare Society-Ready Graduates** – Many Division faculty are based on university campuses and have appointments as teaching faculty in addition to their Division research or extension appointments.

The 2003-2004 CSREES Report of Accomplishments provides a comprehensive report of the University of Arkansas’ annual accomplishments, with program information organized under the five national goals for the Cooperative Extension Service and the Agricultural Experiment Stations.

Respectfully submitted,

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Introduction

The Arkansas Cooperative Extension Service is the statewide public service education component of the University of Arkansas System's Division of Agriculture. The mission of the Arkansas Cooperative Extension Service is to develop and transfer need-based educational programs in response to issues identified by citizens at the local level and to support Arkansas' economic, environmental, and social goals. Extension works to achieve these goals through partnerships with producers, public and private sector organizations, and through the use of new technologies and research-based information transferred to individuals, families, communities and businesses across Arkansas. Through research and education, the Cooperative Extension Service:

- Empowers the agricultural system with knowledge that will improve our competitiveness in domestic production, processing, and marketing;
- Supports and strengthens the health and economic well-being of Arkansas families;
- Provides experiential learning opportunities for the state's youth to support their growth and development in citizenship, leadership, and life skills; and
- Fosters individual, organizational, and community development to maximize the leadership potential of all Arkansans.

During the October 2003-September 2004 fiscal year, Extension increased the commitment to state-wide accountability and analysis of program impact. Through the implementation of the web-based Arkansas Information Management System (AIMS), Arkansas Extension is now positioned to mine data to more efficiently assess the scope and effectiveness of program efforts. In 2003-2004 Extension faculty made 1,903,684 educational contacts. For the first time ever, Arkansas Extension now has the capacity to evaluate these contacts on multiple levels in a timely fashion, to examine our impact based on measures of diversity, efficiency and effectiveness. The reported educational efforts resulted in 152,703 new practices adopted by our stakeholders, with 123,042.91 volunteer hours likewise being contributed toward program implementation. The total value of volunteer hours to Arkansas communities alone has been estimated at a value of \$2,115,107.62.

For the purpose of this report, the accomplishments of Extension's planned programs have been summarized, and selected programs are reported under the five national goals of: Goal 1: An agricultural production system that is highly competitive in the global economy; Goal 2: A safe and secure food and fiber system; Goal 3: A healthy and well nourished population; Goal 4: Greater harmony between agriculture and the environment; and Goal 5: Enhanced economic opportunity and quality of life for Americans. This report represents only a portion of our total Extension programs.

Contact Person:

Dr. Ivory W. Lyles
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Goal 1 – An agricultural system that is highly competitive in the global economy.

Agriculture is a very large and diverse industry in Arkansas. The industry provides 20 percent of the jobs with the added value of \$13.6 billion. Arkansas agriculture contributes approximately 12 percent of the state's gross product. The University of Arkansas Cooperative Extension Service conducts numerous educational programs to improve the efficiency of production for a very diverse agriculture industry.

Educational programs to better position Arkansas row crop growers (rice, cotton, soybeans, wheat, corn and grain sorghum) in a world economy are a major effort of the Cooperative Extension Service. Arkansas rice growers produce 48 percent of the country's rice production, with a record-setting average yield of 154 bushels per acre in 2004. Areas of educational emphasis included rice variety selection, groundwater management and conservation, nutrient management, and controlling of rice diseases. This was attributed to improved varieties and improved management practices under less than favorable weather. The Rice Verification Program yields averaged 171 bushels per acre, resulting in an average net return of \$178 per acre. Farmers used the U of A Soil Testing Lab and Extension's recommendations for fertilizer recommendations on 69 percent of the rice acreage.

Arkansas ranks fourth in the United States for cotton production. Extension's cotton program includes an integrated approach that includes variety selection, fertility and soil management, IPM, harvest management and reducing production expenses. Shifts in pest management technologies and labor shortages have forced a change in conservation tillage practices. The Cotton Verification Program (CRVP) conducted on six fields continues to make a major impact for cotton growers. The program demonstrated that variety selection can improve income per acre by an average of \$100 and that proper timing of cotton harvesting returned \$50 to \$75 per acre. Yields for CRVP fields averaged 1,357 pounds per acre. Arkansas state yields during the last four years have exceeded those of the other mid-south states (Louisiana, Mississippi, Missouri, and Tennessee), yielding a record 1,112 pounds per acre in 2004.

Soybean yields were impacted largely by weather, but pest management, irrigation techniques and fertility were huge contributors. Arkansas produced a record-setting average yield of 38 bushels per acre in 2004, breaking the records set in 1994 and 2002. Only 60 percent of the soybean acreage was irrigated, and 86 percent of the acreage was produced using transgenic soybeans. The 2004 Soybean Research Verification Program consisted of 19 commercial soybean fields. A number of production practices (varieties, fertilizer applications, reduced tillage, weed control, irrigation, etc.) were evaluated based on Extension's recommendations. The average yield per acre for these fields was 53 bushels.

Feed grain crops (wheat, corn and grain sorghum) were planted on 980,000 acres in 2004, which is down primarily because of poor wheat planting conditions. Arkansas wheat farmers harvested 620,000 acres of wheat which averaged 53 bushels per acre. The Wheat Research Verification Program included 11 fields in 2004 and, through improved management, improved the yield per acre. Arkansas farmers harvested 305,000 acres of corn in 2004. Grain sorghum acreage was down primarily due to higher prices for other crops.

Livestock production in Arkansas consists primarily of beef cattle, dairy cattle, swine, and horse production. The Arkansas Beef Improvement Program continues to demonstrate cost effective management practices. The program focuses on the beef cattle enterprise using an integrated resource management team approach to solving problems. Some of the accomplishments of the program included reducing specified cost per animal unit by 23 percent from year one to year five of the program, improving mature cow-calf crop percentage from 85 percent in year one to 93 percent in year five, and reducing the average supplemental feed cost per animal unit from \$48 to \$24 over the five years of the program. County workshops, programs and popular press articles are methods used to transfer ABIP knowledge gained to other producers. Other beef cattle educational programs included Arkansas Beef Quality Assurance Program and Reducing Winter Feed Costs, among others.

Extension dairy programs helped dairy producers and related industries identify areas to enhance production efficiency and compete in an increasingly competitive national milk market. The number of dairies decreased but herds increased in size. Waste management, Dairy Herd Improvement Program, and forage quality are just a few of the educational topics addressed by Extension.

Although horse ownership is primarily a recreation, it does contribute approximately \$3 billion to the state's economy. Educational programs such as Positive Reinforcement for Excellent Performance (PREP) Training, Horsemen's Short Course, and other horse care and management programs were delivered to over 3,300 horse owners last year.

Forages are the basis of a healthy livestock industry. Educational programs included grazing schools, strip grazing for stockpiling forages, alfalfa demonstrations highlighting grazing and hay production, soil management to improve bermudagrass stand demonstrations and forage youth programs.

Horticulture (commercial and recreational) not only contributes to the state's economy but also improves the quality of lives for many Arkansans. A broad selection of fresh market vegetable crops (tomatoes, melons, squash, peppers, etc.) continues to increase in acreage. In addition, ornamental horticulture is one of the fastest growing segments of agriculture. Extension activities centered around marketing, production systems, maintaining quality, cultivars selection, and retail business (nursery, greenhouse, landscape, etc.).

Other important areas of Extension programming include Poultry Production and Management. Arkansas ranked 2nd, 3rd, and 8th in broiler, turkey, and egg production. Extension programs included Poultry Breeder Management training, Breeder Management workshops, Hatchery Management training, Animal Health – Poultry Disease Prevention, and Impact of Water Quality in Poultry Production, among others.

The educational programs of the University of Arkansas Cooperative Extension Service are as diverse and comprehensive as Arkansas' agriculture industry itself.

Total FTEs

217.54

Total Budgetary Amount

\$10,080,423.65

KEY THEME:

ADDING VALUE TO NEW AND OLD AGRICULTURAL PRODUCTS

Program Response: Using Cotton Gin Waste

Contact: Gary Huitink, Biological and Agricultural Engineering, 501-671-2242,
ghuitink@uaex.edu

Situation

Cotton ginners need alternative uses for ginned material other than cottonseed and cotton lint; hopefully, valuable enough to provide some gin income. Approximately 90,000 tons of gin waste is produced annually in Arkansas. Assisting cotton ginners and others to develop outlets for their gin waste as a valuable soil amendment, erosion control agent, power generation fuel, landscape product, etc., will improve their gin profitability.

Stakeholder Input

Education and consultation with ginners regarding gin waste options has initiated several applications for gin byproducts.

Overview

Each ginner's locale provides a somewhat unique mix of potential uses for gin byproducts (waste). Technical support to bring sources and users together is good economy for those with potential uses, ginners and society.

Extension Program Results and Accomplishments

Output Indicators

- Approaches to manage and market gin waste to gain value were explained to ginners who participated in the Annual Cotton Ginners' School and in a variety of individual consultations.
- Developed a class outline, exam and taught designing gin waste utilization options for Cotton Ginning Systems Technology and Management course at Mississippi State University. A publication, "Gin Waste Alternatives," is being developed and will be printed by The Cotton Foundation to provide recommendations for ginners and growers in all cotton-producing states.

Outcome Indicators

- Gin managers are developing waste uses. Most is utilized for agricultural or horticultural uses, including two or three composting facilities. One entrepreneur bags and supplies Wal-Mart with composted product, available “off the shelf” in local stores for lawns, gardens and other horticultural uses. Some gins have contracted to supply gin waste to restore recently-shaped fields.
- A few gin managers are utilizing basic research to test market waste for creative uses. A few are investigating higher-value, novel alternate uses for gin waste, including use as a raw material to replace a portion of the wood normally used in a wood millwork industry.

- Dumas Gin Company has built their own compost turner and they manage their gin's waste. They have received more requests for composted gin waste than they were able to supply from the 2003 and 2004 cotton crops.
- Arkansas gins have not been cited for environmental pollution.

Source of Funds

Smith-Lever, National Cotton Council, Southern Cotton Ginners Association.

Scope of Impact

Dissemination – Gin managers are using contracts, bids and other arrangements to clear waste from gin property before the Arkansas April 15 pink bollworm cleanup deadline. Some is applied to recently-shaped (leveled) fields to restore productivity. Gin personnel are taking leadership to develop proper uses for waste and are responsible for avoiding environmental pollution.

Professionals throughout cotton-producing states are taking a team approach to recommendations and training for utilizing gin waste. Gins are meeting the regulatory standards of the Arkansas Department of Environmental Quality.

Scope of Program – Arkansas (and cotton-producing states) gin managers and potential gin waste users.

KEY THEME:
AGRICULTURAL PROFITABILITY

Program Response: **Commercial Vegetable Production**

Contact: Craig Andersen, Extension Horticulture Specialist, 479-575-2639, Horticulture

Situation

A broad selection of fresh market vegetable crops was grown statewide in 2004. These crops included tomatoes, peppers, melons, squash, pumpkins, sweet corn, sweet potatoes, cabbage, greens, spinach and southern peas. The acreage continues to increase as new growers come into the market and as marketing opportunities mature and new ones appear. After a spring, where the weather was favorable for vegetable crops, excessive

rain during June and cool weather during July both damaged and delayed early vegetable crops. Poor quality due to excessive rain made 2004 a poor year for the state's spring tomato industry. The use of drip irrigation and plasticulture has been successful, providing consistent production of many fresh market vegetables. The processing vegetable production in the state continued to increase this year. Southern peas, green beans, greens and spinach were the leading processing crops grown in Arkansas in 2004. A significant expansion in the number of farmer's markets occurred in 2004, providing more marketing outlets for growers.

Multi-disciplinary collaboration between growers, Extension personnel, researchers, state and federal agencies continued in efforts to solve problems critical to the state's vegetable industry.

Marketing continues to be a challenge for all perishable horticultural crops, especially vegetables. Continued assistance from the state level with horticultural marketing will significantly improve the potential for horticultural crops in the future of Arkansas. Increasing growth of retail marketing in both urban and rural areas will create opportunities for vegetable growers as well as enhance quality of life in local communities. Market development will be critical for vegetable growers to fully realize opportunities.

Stakeholder Input

Stakeholders are actively recruited in each county to help identify needs and provide critical review of county programs in meeting the needs of the county. Stakeholders include, but are not limited to, producers and horticulture-industry representatives. County Extension agents and Extension specialists utilize this feedback in developing county and statewide programs to meet the needs of all clientele. These programs include, but are not limited to, formal educational meetings, field meetings, demonstrations, newsletters and development of educational materials distributed through traditional means as well as electronically. Cooperative efforts with grower groups, regulatory agencies and other organizations with horticulture interest also provide valuable feedback in programming on a regional and statewide basis.

Overview

The most significant issues facing our clientele include:

Marketing – The number of crops and the quantity that can be grown are limited by the ability of the growers to sell their crops. Perishable crops must be marketed within a short time span or the value is lost.

Production Systems – Changes in production systems allow growers to produce crops more efficiently. Shifts in production systems will benefit the producers as well as the environment.

Labor – Much of the fresh market vegetable industry depends on hand labor for harvesting and packing the product. Hiring and training enough labor to meet the needs of the industry is a significant problem.

Maintaining Quality – Harvest and quality management are essential. There are no discounts for poor quality; poor quality does not sell. Post harvest management is essential for maintaining quality.

Cultivar Selection – Variety selection should best fit genetics as well as pest management needs.

Food Safety – Education of growers and handlers of produce to maintain a safe and wholesome food supply.

Extension Program Results and Accomplishments

Output Indicators

- | | |
|-------|---|
| 1,226 | Number of educational publications, mass media, and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties. |
| 494 | Number of educational meetings, demonstrations, farm visits or field days held to educate commercial clientele and other interested parties. |

- 40 Number of workshops on nutrition, production, and post harvest, marketing and/or breeding and selection conducted to educate commercial clientele and other interested parties.
- 13,954 Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials.
- 4,140 Number of participants that examined new production technologies.
- 52 Number of commercial operations.

Outcome Indicators

- 1,623 Number of participants that reduced their chemical and fertilizer inputs.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Available state wide through web, publications, and media releases.

Scope of Program –

1. State Specific: Arkansas, Baxter, Benton, Boone, Carroll, Clark, Cleburne, Columbia, Conway, Craighead, Crawford, Dallas, Desha, Faulkner, Fulton, Garland, Grant, Greene, Hot Springs, Independence, Izard, Jefferson, Johnson, Lawrence, Logan Lonoke, Madison, Marion, Miller, Monroe, Montgomery, Newton, Ouachita, Perry, Pike, Polk, Pope, Prairie, Pulaski, Randolph, Saline, Searcy, Sebastian, Sharp, Stone, Union, Van Buren, Washington, White, Yell.
2. Multi-State: AR, OK.

Program Response:
Cotton Production Education

Contact: Dr. William C. “Bill” Robertson, Extension Agronomist - Cotton, 501-671-2186, wrobertson@uaex.edu

Situation

Arkansas cotton producers and crop advisors make key management decisions that impact yield as well as profitability. These decisions include, but are not limited to, variety selection, fertility and soil management, IPM/COTMAN data collection and

interpretation and maintaining quality of lint in an effort to reduce production costs while maintaining high levels of production.

Stakeholder Input

Stakeholders are actively recruited in each county to help identify needs and provide critical review of county programs in meeting the needs of the county. Stakeholders include, but are not limited to, producers, agricultural advisors and Ag-industry representatives. A small but representative group of individuals whose livelihoods are directly impacted by cotton make up the Cotton Agriculture Council in each county. The councils meet annually with agents and specialists. The County Council has a direct impact in the development of the educational program of the county through their feedback. County Extension agents and Extension specialists utilize this feedback in developing county and statewide programs to meet the needs of all clientele. These programs include formal educational meetings, field meetings, demonstrations, newsletters and development of educational materials distributed through traditional as well as electronic means.

Cooperative efforts with promotion boards, grower groups, regulatory agencies and other organizations with cotton interests also provide valuable feedback in programming on a regional and statewide basis.

Overview

The most significant issues facing our clientele include:

- **Variety Selection:** The number of variety/technology combinations available is plentiful and often confusing. Variety selection should best fit genetics suited for their production systems as well as pest management needs.
- **Fertility and Soil Management:** Fertility needs should be based on meeting the plant's needs. Shifts in tillage systems benefit the producers as well as the environment.
- **IPM/COTMAN:** IPM programs are the foundation of our cotton educational programs. COTMAN is a tool that can help tie all cotton Extension programs together in a systems approach including initiation and termination of cultural practices.
- **Maintaining Quality:** Harvest management is essential in maintaining high quality. Discounts as a result of poor quality are costly to producers. Harvest aid timings can greatly impact fiber quality.
- **Reducing Production Expense:** Yield drives profit. Reducing expenses per unit of production is the key to keeping the cotton industry competitive in Arkansas.

Extension Program Results and Accomplishments

Output Indicators

In efforts to meet the needs of clientele, the following were implemented in 2004:

Demonstrations

- 6 Cotton Research Verification
- 11 Variety
- 3 Plant Growth Regulators
- 2 In-furrow/Seed Treatment Protectants
- 3 Harvest Aid Timing
- 1 Subsurface Drip Irrigation

Educational Meetings

- 19 Production Meetings
- 2 Cotton Scout Trainings
- 10 IPM Meetings
- 7 Harvest Aid Meetings
- 9 Field Day/Crop Tours

Applied Research

- 2 Plant Growth Regulators
- 2 Fertility
- 4 Harvest Aid
- 1 Subsurface Drip Irrigation

Outcome Indicators

- Arkansas cotton growers harvested a record 1,112 pounds of lint per acre from 900,000 harvested acres for a total production of 2.085 million bales in 2004 according to the latest estimates. Our yield of 1,112 pounds shatters last year's record of 914 by almost 200 pounds of lint per acre. Our growers set a production record in 2004 as well. The previous record of 1.982 million bales was established in 1948 from 2.305 million harvested acres. Arkansas leads the Mid-South in lint per acre yields, trailing only California and Arizona when comparing one- and three-year averages.
- Arkansas ranked fourth in production nationwide in 2004, producing approximately nine percent of the U.S. crop from less than seven percent of the U.S. harvested acres. The Arkansas cotton and cottonseed crop is generally valued at over \$500 million annually.
- 1,730 farms in Arkansas produce cotton, three-fourths of which are irrigated.
- Shifts in pest management technologies and labor shortages on the farm have been the driving force in the adoption of conservation tillage practices. The use of conservation

tillage practices has increased from 18.1% to 25.2% of cotton acreage in Arkansas since 1992 as reported by the Conservation Tillage Information Center. They also report the use of intensive-till practices dropping from 70.4% to 53.5% during the same time frame. Continued effort in demonstrating the benefits of conservation tillage is critical to sustaining this trend. These shifts benefit producers as well as the environment.

- Cotton producers are using COTMAN and other tools in an IPM program to better time cultural practices ranging from irrigation initiation, supplemental nitrogen requirements, insecticide timing, as well as better timing the termination of irrigation and insecticide applications and defoliation activities. There remains a tremendous opportunity to increase the utility of COTMAN to assist in improving profitability.
- The quality of cotton produced in Arkansas is high. One composite measure of quality is reflected in cotton termed “tenderable” or of sufficient quality to meet standards for delivery on New York No. 2 futures contract. Arkansas was second only to Missouri (79.0% vs. 81.8%) in the percentage of “tenderable” bales produced this season in the Mid-South.
- The Cotton Research Verification Program (CRVP), developed in Arkansas in 1980, continues to be a well-accepted program by all clientele. In 2004, the CRVP realized the highest yielding season in its 25-year history (1,357 lb/A). With six active fields comprised of diverse cultural practices, the program reflected Arkansas cotton production and the scenarios growers faced throughout the season. The program enjoyed the second highest net return since 1996 (\$102.17/A), although the average loan price was the lowest since 1996 (\$0.5498/A). The CRVP remained a vital tool for educational efforts. This program offers an excellent means to transfer technology to producers as well as offer valuable hands-on training for county Extension agents.

Source of Funds

County programs and the CRVP are funded with Extension (Smith-Lever) and IPM funds. Applied research/demonstrations and seminars/meetings are funded by outside sources such as industry grants and/or funding by Cotton Incorporated. Direct funding totaled over \$100,000, and “in kind” gifts totaled \$94,000 for the cotton program.

Scope of Impact

Dissemination – Information is disseminated to any interested party through mail, Extension web sites, personal communications, *Cotton Comments*, and by producer meetings, conferences and seminars. Publications and Extension support materials developed include:

- 5 Presentations/Posters at Professional Meetings
- 6 Extension Publications
- 9 Articles in Research Bulletins
- 3 Educational Materials
- 3 Individual Articles

- 9 Article Interviews
- 5 Television and Radio Interviews
- 1 Computer Software
- 6 Teaching Aids

Scope of Program – The majority of the cotton program is state specific and directed to Arkansas cotton producers. The program impacts at least 25 of the counties in Arkansas. Cotton producing counties include Lafayette, Miller, Ashley, Chicot, Desha, Drew, Lincoln, Jefferson, Lonoke, Pulaski, Prairie, Arkansas, Woodruff, Cross, Monroe, Lee, St. Francis, Monroe, Phillips, Crittenden, Mississippi, Poinsett, Craighead, Greene and Clay counties. This program impacts all counties in Arkansas where cotton is produced. Multi-state Extension efforts exist between Mississippi, Missouri, Louisiana and Texas, primarily through the use of COTMAN.

Programs of Excellence

Cotton Production and Management

Selecting high-yielding, well adapted cotton cultivars was a major management decision facing local growers. Weed control and budworm control problems on many farms prompted Extension to plan and conduct a cotton cultivar performance demonstration on the Andrew Whisenhunt farm (Lester Place) in 2004. A demonstration using stacked gene varieties was planted and managed for local growers to observe. The cotton variety demonstration field is located on the Lester place about 12 miles south of Lewisville, Arkansas, on the Andrew Whisenhunt farm. The goal of the project is to demonstrate the adaptability, yield, and lint quality of RR/Bt varieties currently available commercially to local growers.

Locations – Lafayette and Miller counties.

Impact Numbers – A grower tour of the plots was held 7/21/04. Twenty-four growers and agribusiness personnel attended the tour. As a result of these demonstrations, growers are planting more of the high performance cultivars such as DPL 555, ST 5599 and ST4892. County average yields have increased by 34 pounds lint per acre over the past 2 years. Growers are planting the better performing varieties and their yields have improved.

Contact Information – Joe Vestal, 870-921-4744, jvestal@uaex.edu

Grower Uses Foliar Fertilizer to Increase Yields

Cotton grower Tim Spruell was assisted with foliar fertilizer recommendations for cotton fields suffering water damage due to wet conditions in June. Saturated soil conditions had restricted root growth which was affecting nutrient uptake and squaring rates. Extension assisted with a foliar fertilizer demonstration. Yields of the treated area were 65 pounds more lint per acre. The cotton foliar fertilization demonstration was established to improve cotton lint yields on the Spruell Farm.

Location – Gin City, Arkansas – Lafayette County

Impact Numbers – Four cotton growers were provided information on foliar fertilization and use of PGRs for cotton yield improvements. Growers report a lint yield increase of 40 pounds per acre on 740 acres. Cotton growers are routinely applying foliar fertilizers to stressed cotton fields.

Contact Information – Joe Vestal, 870-921-4744, jvestal@uaex.edu

Greene County Cotton Variety Demonstration

Choosing the correct cotton variety is a local need addressed by this program. This program demonstrates the performance of the top cotton varieties grown in Greene County. The goal of this program is to assist Greene County producers in selecting the most adapted cotton variety.

Location – Schugtown, Arkansas.

Impact Numbers – 30 Greene County cotton producers were served by this demonstration. Choosing the correct cotton variety can increase yields by 300 pounds per acre. There are 8,000 acres of cotton in Greene County. 300 pounds x 8,000 acres would equal an increase in gross income of \$240,000 to Greene County cotton producers.

Contact Information – Mark Brawner, (870)236-6921, mbrawner@uaex.edu

COTMAN Regularly Used To Manage Cotton Crop

Being on the northern end of the cotton growing belt, local producers often have a difficult time in determining timing and need for inputs toward the end of the growing season. Through the use of the COTMAN program, producers have become more in tune to manage their crop, especially at season's end. The farmers participating in the program were better able to track the growth and development of their crop. Timing of inputs was more finely tuned based upon heat unit accumulation for a specific field, particularly late in the season. Due to extensive educational efforts the past few years, similar to this program, many growers and consultants are sold on the COTMAN program.

Location – The COTMAN expert computer system was used to help manage the timing and need for inputs for fields in Mississippi County. Four farms participated in the COTMAN program conducted by the Extension Service in Mississippi County in 2004. COTMAN data was collected on five fields weekly throughout the growing season. Five farmers and 2 consultants were involved in the program.

Impact Numbers – It is estimated the program is used on 50,000 acres of cotton grown in Mississippi County. Producers and consultants praise the program for helping them determine whether that last insect application is needed and for figuring out when to apply harvest aid materials. They like the fact that the program is fairly simple. Late season insecticide termination and time to begin harvest aid application are based on heat units past node above white flower five. The program is expected to eventually be used on up to half the county's cotton acreage.

Contact Information – Dave Freeze, 870-762-2075, dfreeze@uaex.edu

Do Not Spray Blind, Know the Pest

The Cotton IPM Moth Trapping program in Lee County has been a good tool for the cotton producers. Information on moth numbers and type, budworm or bollworm, allows the producer to know which worm he has, and this will keep him from possibly spraying for the wrong pest. The moth trap report was sent out via e-mail and fax to producers and agribusinesses to alert them of numbers and type. Moth numbers proved to be low in 2004, and this information saved the producer input per acre in insect control cost. The Cotton IPM Moth Trapping program is a part of the overall IPM program that covers cotton, rice, and soybeans. These programs are there to assist producers in planning and carrying out an Integrated Pest Management program on their farms. IPM can save input costs by lowering the amount of capital outlay for pest management.

Location – The IPM program was conducted over the entirety of Lee County.

Impact Numbers – The trap reports were sent out via fax and e-mail to 14 producers, agribusinesses, and consultants twice a week. Around 90% of those receiving the reports used them in making production decisions pertaining to insect pests. More producers are aware of the IPM program, and the moth trapping program is now a part of the process of cotton pest management in Lee County.

Contact Information – Mike English, menglish@uaex.edu

Cotton Moth Trapping Program

Flights of boll and budworm moths have historically been indicative of a pending worm outbreak in the cotton-growing regions. By monitoring these flights, the information can be used to know when to scout for the worms, which can do considerable damage in the Non BT cotton. The goal of this program is to monitor the flights of boll and bud worm moths in order to provide farmers and consultants an idea of how many moths are in the area at a particular time so that they can monitor for worms in their cotton.

Location – 4 towns/1 county. Moth trapping in eastern Poinsett County was conducted at 4 locations deemed to be areas prone to high infestation levels of moths in the past – Tyrone, Marked Tree, Trumann, and Weona. This information was available on the University web site, as well as distributed at bi-weekly cotton consultant meetings.

Impact Numbers – Information was also made available to the 96 growers in the county. The consultants and farmers were able to plan and time their scouting programs around the trapping information, to make informed decisions and spray on a more timely basis, thereby resulting in substantial savings.

Contact Information – Craig Allen, (870)578-4490, callen@uaex.edu

Program Response: Equipment and Techniques for Reduced Tillage and No-Tillage (Soybeans, Wheat, Cotton, Rice, Corn and Grain Sorghum)

Contact: Gary Huitink, Biological and Agricultural Engineering, 502-671-2242, ghuitink@uaex.edu

Situation

Soybeans and wheat have generated little profit in certain years, and in some cases soybeans have been produced at a loss in Arkansas. Direct-seeded or no-tillage soybeans, wheat, rice, cotton, corn and grain sorghum that were grown without tillage reduced labor and fuel costs for

production. TMDL guidelines are imminent, requiring soil conservation measures to reduce sediment loads in some cropped watersheds. Challenges remain to guide growers about appropriate drainage and equipment required for profitable yields. These criteria are essential to produce grain and cotton economically using no-tillage in Arkansas.

Stakeholder Input

Arkansas and Mid-South growers are asking for equipment and crop production guidelines to produce crops with equal yield using direct-seeding (no-tillage). These needs will become more specific as TMDL criteria are set for each watershed. If “best management plans” are implemented for cropped land, more research and technical data is needed than that required for hay meadows or grazing lands. Growers desire to reduce their fuel and labor costs while maintaining or increasing yields. Proper drainage, seeding and timeliness are three key factors that include engineering to implement the reduced or no-tillage appropriate for a soil or part of a field.

Overview

Consulting and education on adequate drainage, reduced pre-plant tillage and appropriate use of subsoiling to improve production of cotton, rice, soybeans, wheat, corn and grain sorghum are increasing. Replicated studies on the University of Arkansas experiment stations and on farms have demonstrated the effectiveness of direct seeding, subsoiling, crop rotation and reduced traffic for corn, cotton, grain sorghum, soybeans, rice and wheat production. More research applied to typical soils in Arkansas and to adapt recommendations to growers’ fields is needed. Consultation, field days, demonstrations and meetings provided growers practical techniques.

Extension Program Results and Accomplishments

Output Indicators

- Replicated experiments were conducted with corn, grain sorghum, rice and soybeans at the UA Pine Tree Experiment Station.
- Recommendations on equipment and drainage and other consultation aided cotton and grain growers.
- Meetings, consultation and field visits aided agents, crop verification cooperators and other growers.

Outcome Indicators

- Replicated no-tillage experiments conducted at the UA Pine Tree Experiment Station reinforced that adequate drainage and seeding on beds are valuable, if not vital, for corn, cotton and grain sorghum. Direct-seeded soybeans and cotton are becoming accepted

practices by progressive growers. Growers are inquiring about vital equipment, management requirements and procedures to maintain yields with direct seeding. Producers desire to reduce the time, labor and fuel per acre needed to produce a crop. County agents, consultants, growers and others are using these data and recommendations.

- An estimated two-thirds of the wheat crop, more than one-third of the soybean crop and 1/4 of the cotton crop were direct-seeded in 2004.
- Significant portions of the cotton, rice and soybean crops were seeded as “stale seedbed” in 2004.
- Pioneering growers were direct-seeding corn, cotton, grain sorghum and rice this past year.
- Estimate that 1 million acres are subsoiled annually in Arkansas, when fall weather allows.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – Most growers desire information on how to manage stale seedbed and no-tillage, and some are requesting information on drainage and equipment recommendations.

Approximately 1 million acres are now subsoiled annually in Arkansas, using recommendations based on UA Division of Agriculture data and recommendations.

Scope of Program – This program is available through county extension offices throughout the area where soybeans are grown in Arkansas. County agent and grower training and consultation were provided as requested. Subsoiling developments pioneered in Arkansas have been replicated in educational efforts in Louisiana, Mississippi, Missouri, North Carolina, South Carolina and Tennessee. University of Arkansas Cooperative Extension Service guidelines are available in print and on the Cooperative Extension Service web site.

Program Response: Extension Soybean Educational and Applied Research Program

Contact: Dr. Chris Tingle, Extension Agronomist – Soybeans, 501-671-2278,
ctingle@uaex.edu

Situation

In 2004, producers planted 2.99 million acres, which is only slightly down compared to previous years. With this large acreage, soybeans remain the largest (based on planted acreage) row-crop in Arkansas, and revenues generated from soybean production are vital to the soybean producer. Each year, soybean producers are trying to maximize production efficiency and profits while minimizing expenses. Production efficiency in 2004 was impacted largely by the weather, but pest management issues (weeds, insects, and diseases), irrigation techniques, and fertility problems still impacted production. The Arkansas soybean program addressed many of these issues through its Soybean Research Verification Program (SRVP) and provided key recommendations for efficient soybean production.

Stakeholder Input

In many instances, County Agriculture Councils planned educational programs consisting of demonstrations, participated in the SRVP, conducted educational meetings, etc., to address the long-term sustainability of soybean production and other row crops in the county. In addition, Extension was called upon to deal with emerging issues of 2004 that were pretty much unforeseen and had to be dealt with through spontaneous educational programming as the crop season progressed.

Overview

The most significant issues facing our clientele include:

- **Variety Selection Criteria:** In 2004, over 200 different varieties were tested in the University of Arkansas Variety Testing Program. With these options, producers are constantly searching for high-yielding varieties that are suited to their production systems. In addition, with at least nine soybean seed companies headquartered in the state, providing an unbiased source of research-based variety recommendations is crucial.
- **Fertility and Soil Management:** We continue to find fertility issues each year. Emerging issues, such as boron deficiency, are increasing throughout much of the major soybean-producing regions of the state. These problems should continue to be addressed. Additional testing is needed to ascertain the benefits of conservation tillage in Arkansas soybean production systems.

- **Reducing Production Expense:** Based on current Farm Bill legislation, yield is the primary factor that drives profit. Reducing production expenses without sacrificing yield losses is the overall goal of Arkansas soybean producers.
- **Irrigation Technology:** Arkansas soybean producers are gradually realizing the potential benefits of irrigation. While some areas of the state are dealing with water availability issues, current research is needed to help in irrigation efficiency.

Extension Program Results and Accomplishments

Output Indicators

In efforts to meet the needs of clientele, the following were implemented in 2004:

Demonstrations

- 19 Soybean Research Verification Program Fields
- 5 Variety
- 10 Production Topics

Applied Research

- 3 Seed Treatment Evaluations
- 3 Conservation Tillage Evaluations
- 2 Fungicide Evaluations

Educational Meetings

- 1 Arkansas Soybean Research Conference
- 58 County Production Meetings
- 15 Field Day/County Crop Tours

Outcome Indicators

In 2004, Arkansas harvested 2.89 million acres of soybeans with an average yield of 38 bushels per acre. This average set a new record, surpassing the previous record of 34 bushels per acre set in 1994 and again in 2002. Arkansas ranks 9th nationally in soybean production, and soybeans are produced in 42 counties in Arkansas. Only 60% of the soybean acreage in 2004 was irrigated and 86% of the acreage was produced using transgenic soybeans.

The 2004 Arkansas Soybean Research Verification Program (SRVP) consisted of 19 commercial soybean fields. The Early Season (ESPS), Full Season (FSSPS) and Doublecrop (DCSPS) production systems were utilized in the 2004 SRVP. All three production systems were represented within the irrigated environment, but only the ESPS

was represented in the non-irrigated production environment. Varieties of maturity group III, IV, and V were selected using SOYVA, a computerized variety selection program, and planted from April to July. Fertilizer applications, tillage, weed control, irrigation, and all other management practices were implemented according to research-based University of Arkansas (U of A) Extension recommendations. The SRVP average yield for the 10 irrigated FSSPS fields was 53 bushels per acre. Four irrigated ESPS fields averaged 51 bushels per acre, while the four irrigated DCSPS fields averaged 52 bushels per acre. In the non-irrigated environment, one ESPS field averaged 47 bushels per acre. The overall SRVP yield average was 52 bushels per acre compared to a state average yield of 38 bushels per acre.

Source of Funds

County programs are funded with regular Extension (Smith-Lever) and IPM funds. Replicated studies and other conferences and seminars were all funded by outside sources such as industry grants and/or funding by the Arkansas Soybean Promotion and/or United Soybean Board (total grants are approaching \$250,000 in value). Agricultural industry also donates materials valued in excess of \$20,000 annually to assist with the Arkansas soybean Extension and applied research program.

Scope of Impact

Dissemination – Information is disseminated to any interested party through e-mail, mail, Extension web sites, personal communications, and by producer meetings, conferences and seminars. Publications and Extension support materials developed include:

- 3 Extension Publications
- 16 Educational Materials
- 59 Article Interviews
- 25 Television and Radio Interviews
- 2 Computer Software Programs

Scope of Program – All soybean-producing counties in Arkansas have delivered one or more of these educational efforts contributing to the viability of the Arkansas soybean industry. High yields and improved management of natural resources, while developing programs to deal with the ever-changing production environment in Arkansas, are some of the accomplishments attributed to the Arkansas soybean educational and applied research program.

Programs of Excellence

Soybean Research Verification Program

The Soybean Research Verification Program (SRVP) continues to have far-reaching benefits to Arkansas soybean producers. Being able to provide soybean producers with accurate research-based recommendations for soybean production is critical. The overall SRVP yield average was 52 bushels per acre compared to a state average yield of 38 bushels per acre. Based on the 2004 USDA average price for soybeans (\$7.25 per bushel), the SRVP fields provided a \$101.50 per acre increase in total returns. Specifically, one Phillips County participant increased yields from 35 bushels per acre in 2001 to 51 and 48 bushels per acre in 2004 and 2003, respectively.

Another example included the incorporation of the Early Soybean Production System (ESPS) in the Arkansas River Valley region. Dustin Tackett, a young Pope County soybean producer, worked with the SRVP coordinators to determine the potential economical and environmental benefits of combining the ESPS and poultry litter as an alternative fertilizer source. Early results indicate that both early planting and poultry litter can provide acceptable yields while providing an adequate source of poultry litter disposal. This may offer an avenue for poultry producers to dispose of poultry litter while possibly improving soybean yields. These preliminary data indicate that additional research is needed to support a recommendation that provides both economic and environmental benefits to Arkansans.

General Program Information – SRVP fields were conducted in 15 different counties in 2004. This marks the 21st year of the SRVP. During this period, 360 commercial soybean fields in 38 Arkansas counties have been enrolled in the program. The SRVP links soybean producers to the Cooperative Extension Service and ultimately to the Agricultural Experiment Station. Together, a team is formed with the goal of increasing soybean profitability in the State of Arkansas. Results obtained from the SRVP include examination of the University of Arkansas's recommended production practices on commercial size fields, strengthening the Cooperative Extension Service's knowledge on soybean production, and increased technology transfer as it relates to soybean production efficiency in Arkansas.

Locations – These success stories highlight the Phillips and Pope County programs.

Impact Numbers – Planted soybean acres in Phillips County were 146,000 and 10,000 for Pope County in 2002. Planted acres statewide were approximately 2.99 million acres, while 2.8 million acres were harvested in 2002.

CES Section Contact Person – Dr. Chris Tingle, Extension Agronomist - Soybeans, 501-671-2278, ctingle@uaex.edu

Early Soybean Production System

The early soybean production system (ESPS) is a relatively new approach to mid-south soybean production and is often a more profitable option to many areas of the state. This system typically consists of planting indeterminate maturity group (MG) III and IV varieties in April. This system can be more profitable in years when moisture is adequate until mid- to late-July. By doing this, many producers that do not have irrigation capabilities have observed satisfactory yields. Other benefits include the increased flexibility in tillage, planting, and harvesting, allowing for better management for soybeans and other crops produced on the farm. There has been rapid adoption of this system throughout the state.

Specific examples include Randolph County where 40 producers were affected by implementing this system. Early estimates indicate that an increase of \$637,000 was a result of implementing this production system. Another example would include Chicot County. There are approximately 200 soybean producers in Chicot County, and almost 80% of these are taking advantage of this production system. Approximately 60% of the planted soybean acreage was planted to MG IV varieties. Traditionally, soybean yields in Chicot County have increased 15% increase in county yields. Additional benefits also include reduced pesticide applications (primarily stink bugs) with this system and resulted in an average savings of \$7.50 per acre. One final example is Crittenden County. Approximately 40% of the soybean acreage in Crittenden County is produced using MG IV soybeans. Savings of \$25.00 per acre have been observed using this technology.

General Program Information – The Cooperative Extension Service assists producers by implementing numerous county variety demonstrations evaluating early maturing soybean varieties and their adaptability to many Arkansas environments. Additional work, identifying economic pest management strategies, irrigation techniques, and soil fertility options, is also conducted each year in multiple counties.

Locations – These success stories highlight the Chicot, Crittenden, and Randolph County programs.

Impact Numbers – Planted soybean acres in Chicot County were 111,000 in 2002. Crittenden County planted 162,000 acres and 48,000 acres were planted in Randolph

County in 2002. Planted acres statewide were approximately 2.99 million acres, while 2.8 million acres were harvested in 2002.

CES Section Contact Person – Dr. Chris Tingle, Extension Agronomist - Soybeans, 501-671-2278, ctingle@uaex.edu

Program Response: Extension Weed Science Educational and Applied Research Program

Contact: Dr. Bob Scott, Extension Weed Specialist, 501-671-2278, bscott@uaex.edu, and Dr. Ken Smith, Extension Weed Specialist, 870-723-5527, ksmith@uamont.edu

Situation

In 2004, producers treated over 90% of their row crop and small grain acres with herbicides. Weed control continues to be the most significant management decision that rice, corn, wheat and soybean farmers face each season. After variety selection, it is often the first management decision made each year. Failure to control weeds can often nullify other concerns as weed competition has the potential to completely rob crops of profitability. In addition, weeds can reduce the value of harvested grain, interfere with harvest and reduce land values. Each year growers attempt to lower weed control cost while still maintaining the maximum yield potential for various production crops. Weed control efforts in 2004 were largely successful in rice, soybeans, cotton and other crops due to good weather, having numerous herbicides available and sound use recommendations for those products. The Arkansas Extension Weed Program helps address weed control issues and herbicide use recommendations through the publication of the MP-44, *Recommended Chemicals for Weed and Brush Control*, and through numerous production meetings and popular press publications.

Stakeholder Input

In many instances, County Agriculture Councils planned educational programs consisting of demonstrations, educational meetings, and research trials. Input from numerous basic herbicide manufacturers was obtained in the form of research protocols. Input was gained from individuals in the Pesticide Division of the Arkansas State Plant Board. Also, producers, county agents, and consultants provided consistent and constant feedback on weed control issues that most impact state crop production, and these issues are addressed in applied research protocols. In addition, Extension weed specialists were called upon to deal with emerging issues of 2004 that were unforeseen and had to be dealt with through spontaneous educational programming as the crop season progressed. An example of this is glyphosate drift to rice, which was a significant issue in 2004.

Overview

The most significant issues facing our clientele include:

- **Herbicide Drift Mitigation and Management** – With the increased reliance on glyphosate as our primary weed control tool in soybeans, cotton and soon corn, glyphosate drift to non-tolerant crops has been an issue. Also, since the introduction of Clearfield rice and Newpath herbicide, drift of Clearfield herbicides onto non-Clearfield crops has been a concern.
- **Controlling Difficult Weeds** – We continue to find new and emerging weed issues each year. In 2004, yellow nutsedge in soybean, glyphosate resistant horseweed in reduced tillage systems, texasweed, red rice in rice and several others are examples of weeds currently in the difficult to control column. Research is needed on herbicides and systems to control these problem weeds.
- **Reducing Weed Control Costs** – Based on current Farm Bill legislation, yield is the primary factor that drives profit. Reducing herbicide expenses without sacrificing yield losses is the overall goal of most Arkansas producers. Research identifying ways to minimize weed control costs while maximizing yields remains an area of importance.
- **Technology Transfer (new herbicides and systems)** – Arkansas producers are introduced to at least one new herbicide each year. The role of the Weed Science program is to provide producers with an unbiased source of information and recommendations on these new products.
- **Herbicide Resistance** – For the past several years, no new herbicide modes of action have been introduced. Furthermore, none appear to be in the pipeline for the immediate future. In 2004, a new weed, common ragweed, was discovered that is resistant to glyphosate. Current research is focused on this and the discovery and control of other weeds with herbicide resistance.

Extension Program Results and Accomplishments

Output Indicators

In efforts to meet the needs of clientele, the following were implemented in 2004:

Demonstrations

25	Soybean weed control
55	Rice weed control
12	Wheat weed control
6	Sunflower weed control
21	Cotton weed control
6	Corn weed control

Applied Research

3		Herbicide drift
3	Conservation Tillage Evaluations	
1	Red rice competition	
20	Weed Control	

Educational Meetings

1	Arkansas Crop Management Conference
62	County Production Meetings
15	Field Day/County Crop Tours

Outcome Indicators

Recommendations for reduced rate weed control programs, including products such as Command herbicide for rice and Roundup for Roundup Ready soybeans, have resulted in savings for growers in the overall costs of their weed control programs. Data from this program have resulted in numerous section 24C and section 18 labels in the state. This program was also instrumental in the development of the Clearfield technology for rice that is now adopted on over 200,000 acres.

Source of Funds

County programs are funded with regular Extension (Smith-Lever) and IPM funds. Replicated studies and other conferences and seminars were all funded by outside sources such as industry grants and/or funding by the Arkansas Soybean Promotion, Arkansas Rice Promotion Board, Arkansas Wheat Promotion Board, Arkansas Corn and Grain Sorghum Promotion Board and several other sources (total grants are approaching \$500,000 in value). Agricultural industry also donates materials valued in excess of \$25,000 annually to assist with the Arkansas Weed Science Extension and applied research program.

Scope of Impact

Dissemination – Information is disseminated to any interested party through e-mail, mail, county agents, Extension web sites, personal communications, popular press articles and by producer meetings, conferences and seminars. Publications and Extension support materials developed include:

2	Extension Publications (MP44 and glyphosate resistant horseweed materials)
12	Educational Materials (consisted of e-mail, PowerPoint presentations, and various bulletins)
45	Article Interviews
20	Popular Press Articles
20	Television and Radio Interviews

Scope of Program – All agricultural counties in Arkansas have utilized one or more of these educational efforts contributing to the viability of the Arkansas agricultural industry. High yields and improved weed management are some of the accomplishments attributed to the Arkansas Weed Science educational and applied research program. In addition, many other states look to Arkansas for leadership in the area of weed management.

Programs of Excellence

General Program Information – Weed control studies are conducted at several locations across Arkansas. These programs focus on solving current and potential weed control issues in the state. Major areas of focus include developing low-cost weed control programs for row crop and small grain producers, managing herbicide resistance, and technology transfer in the form of herbicide recommendations. Research sites are located in Arkansas, Poinsett, Lonoke, Pulaski, Mississippi, and Desha counties.

Red Rice Control in Rice With the Clearfield System

For years red rice has plagued rice producers. No chemical control for red rice has existed for growers to use to control this weed in a growing rice crop. Control measures have consisted of cultural control practices such as crop rotation and water-seeding. Over the past 3 years, a new production system has successfully been launched in Arkansas that addresses this problem. The Clearfield rice production system and Newpath herbicide currently provide growers the option of controlling red rice in a growing rice crop. This system has been extensively researched by our weed science program. Extension recommendations, through multiple media outlets and through the county agent system, have provided growers with sound recommendations and aided in the rapid adoption and success of this new rice production system. Current research is aiding in the longevity of this technology by examining herbicide resistance issues and evaluating stewardship policies.

Locations – This success story comes from all rice-producing counties in Arkansas.

Impact Numbers – Clearfield technology was adopted on over 150,000 acres of rice in Arkansas in 2004. Clearfield acres in Arkansas may top 200,000 in 2005.

CES Section Contact Person – Dr. Bob Scott, Extension Weed Specialist, 501-676-3124, bscott@uaex.edu

Management of Glyphosate-resistant Horseweed

Since it was first identified in 2002, glyphosate-resistant horseweed has spread to numerous counties in northeastern and central Arkansas. In response to this problem,

county programs in the form of research demonstrations were initiated through the county agents. On-farm trials were established to look at alternative control measures. This data was then rapidly disseminated through publications, a production notebook, grower meetings, radio interviews and personal communications. A research initiative grant was obtained that was used to support travel and publication costs associated with this program. This program serves as a template for other counties in Arkansas where glyphosate-resistant horseweed is being discovered. In addition, the recommendations made by Extension as a result of this focus program have reduced the spread and severity of the glyphosate-resistant horseweed problem.

Locations – This success story highlights the Mississippi, Poinsett, and Crittenden County programs.

Impact Numbers – This program has been adopted by over 75% of growers in these and other counties.

CES Section Contact Person – Dr. Ken Smith, Extension Weed Specialist, 870-723-5527, ksmith@uamont.edu.

Program Response:

Farm Management, Marketing and Policy

Contact: Tony E. Windham, Section Leader - Agricultural Economics and Community Development, 501-671-2000, twindham@uaex.edu

Situation

Arkansas agricultural producers faced some of the most volatile prices in recent history during the 2004 production year. Row-crop commodities began the year at near record highs but by harvest time had retreated significantly. Cattle producers saw favorable prices during most of FY04, but uncertainty existed because of export restrictions related to the mad cow situation. These uncertain times require farmers to have a better understanding of commodity marketing for managing risk associated with price.

These producers can benefit from educational programs that address farm management, commodity marketing and agricultural policy concerns.

Stakeholder Input

Specialists in the Agricultural Economics Section are in continuous contact with agricultural leaders in industry, lending, farm organizations, commodity promotion boards and USDA.

Overview

Farm Management

Research Verification Trials – Extension economists conduct detailed economic analyses for the wheat, rice, soybeans, cotton, grain sorghum and corn research verification trials. These projects allow for an examination of the University of Arkansas' recommended production practices and is a method of strengthening Extension agents' expertise in recommended technology. Economic analysis is an important part of the research verification trials and gives specialists and researchers areas to target for improved economic efficiency. Annual reports are published for distribution to promotion boards and clientele.

Production Economics – A series of Extension technical bulletins is developed annually for estimating production costs of wheat, soybeans, cotton, rice, corn and grain sorghum. The production cost estimates were used in numerous grower meetings to help producers evaluate the profit potential for each of the major row crops. The production cost estimates are now available on the Internet through the Extension home page for the general public.

Production economic efforts for cotton focused on:

- Increasing farm profitability.
- Economic analysis of transgenic cotton varieties.
- Economic analysis of no-till row cotton.

The results were presented at state and county meetings and published in a fact sheet, proceedings and newsletters.

Farm Management and Marketing Newsletter – This quarterly publication, designed to bring timely management information to county Extension agents and agricultural producers, continues to gain strength. A typical issue contains equal numbers of articles from research faculty in the Agricultural Economics Department at Fayetteville and from Extension agricultural economists. The newsletter's distribution includes a mailing to all county offices, with some agents forwarding the entire newsletter to their producers. Issues are also directly mailed to organizations and businesses, including the media. Over 1,000 issues are directly distributed to Extension clientele each quarter. In addition, the newsletter is posted on Extension's web page, allowing interested individuals to print off the entire newsletter or a single article.

Commodity Marketing

Commodity Situation and Outlooks – Numerous presentations are made at county level production meetings related to market outlook. This information helps producers in

making both old and new crop marketing decisions as well as management decisions related to crop mix.

Vegetable Marketing Information – County agents and tomato growers appreciate receiving a weekly newsletter during the tomato season that contains information on the U.S. tomato market situation.

Price Risk Management – Numerous seminars and in-service trainings for agents are being conducted on the use of commodity futures options to manage price risk. Clientele are being instructed in the use of puts and calls in combination with LDPs and crop insurance.

Agricultural Policy

The agricultural policy educational and research program places primary emphasis on defining and solving agricultural policy, management and resource development problems of Arkansas farm firm systems and supporting infrastructure with specific emphasis on rice farm systems.

More specifically the program focuses on the following:

- Identifying economic and public policy problems limiting profitability and economic viability of Arkansas Delta farm firm systems and infrastructure.
- The consequences of public policy alternatives on Arkansas farms and infrastructure with primary focus on rice and cotton farms.
- Consequences of technology and the new global economy on Arkansas production systems and infrastructure.
- Given U.S. monetary and fiscal policy and the new global economy, alternative business strategies are proposed to enhance profitability and economic viability of Arkansas farms and infrastructure.

In FY 2004, Extension policy specialists were involved providing agricultural policy and outlook information to clientele through the web, print media and radio and planned and participated in the rice industries national meeting.

Farm Family Risk Management Program

This program continues to provide valuable assistance to producers primarily in row-crop producing areas of Arkansas. The major focus of this program is to help producers evaluate the financial position and performance of their operation and identify strategies to continually improve the overall financial health of their business.

Assistance is being provided to Arkansas row-crop producers in the following areas:

- Financial statement preparation
- Financial analysis
- Cash-flow planning
- Farm record keeping
- Enterprise budgeting
- Marketing strategies
- Purchase or lease decisions
- Irrigation investments
- Land leveling or improvement investments

In addition to individualized farm and financial management assistance, the risk management specialists working in this program conduct workshops in record keeping, financial analysis, and commodity marketing.

The Arkansas Farm Family Risk Management Education Initiative is available to row-crop producers in 27 eastern Arkansas counties. Producers may contact their local county Extension office for information on this program or they may contact the risk management specialist directly. Specialists in this program can provide on-farm assistance to clients. Information is available in brochure form. These brochures are at county Extension offices. Also, these materials are available at county Extension sponsored events. Additional information is available at the web site listed below.

- http://www.aragriculture.org/farmplanning/risk_management.asp

Horticulture Economics

Fruit Enterprise Budgets – A series of budgets have been developed and released throughout the past year. There are 11 vegetable and 14 fruit budgets available for use by horticulture producers. The budgets are available on Extension’s web page as well as through our county offices. The average number of hits per month is 69. In addition to providing a resource for understanding production cost, the budgets outline resource needs, application/operation timing and recommended application rates for seeding and chemical applications.

Survey of Arkansas Horticulture Industry – This statewide project assesses the economic contribution of the state’s horticulture industry. The project collected and analyzed data for seven specific sectors of the industry: (1) fruit, nut, vegetable and herb producers, (2) fruit, nut, vegetable and herb processors, (3) turf producers, (4) golf courses, (5) ornamental producers, (6) ornamental processors, and (7) landscape architects. The published report included three components: analysis of survey data, compilation of secondary data, and estimation and presentation of the industry’s economic impact.

The report provided a summary of data collected for each sector. In addition to providing some descriptive statistics for the industry, economic impacts were estimated. Using input-output technique, the economic impact of the industry on Arkansas' economy was presented and discussed. The report was dispersed to industry stakeholders, academic faculty and policy makers including Arkansas State Horticulture Society, Arkansas Green Industry Association, Arkansas Turfgrass Association, Arkansas State Plant Board, and Arkansas Farm Bureau's Horticulture Committee. Additionally, reports were sent to media representatives.

Marketing Horticultural Products – A marketing program was conducted at two Extension regional training events and a statewide University of Arkansas conference on specific strategies for marketing horticultural products. The focus of those programs examined niche marketing opportunities and the importance of developing business and marketing plans. Additionally, a train-the-trainer workshop was conducted to provide resources and information to producer consultants (county agents, University faculty, and government agency personnel) working with horticulture producers and businesses.

Two brochures were developed and distributed to assist the promotional efforts of the state's horticulture industry. One brochure highlighted direct marketing efforts of primarily fruit, vegetable and nut producers. The brochure provided a listing of farmer's markets and pick-your-own operations in the state. A detailed map was part of the brochure indicating each business/market location and contact information. The second brochure focused on the nursery, ornamental and turf businesses. The brochure serves as a buyers guide for the industry and was a collaborative effort between the University, the Arkansas Green Industry Association and Arkansas Turfgrass Association.

General Program Information – The horticulture economic program has developed and provided information to assist producers in examining the feasibility of starting horticulture businesses, production costs estimates for various fruit and vegetable crops, risk management information, marketing costs, direct marketing options and business structure information. This information includes resources on risk management, and enterprise budget tools for business planning. A link has been developed on Extension's web site entitled, Horticulture Business Resources. The site details available risk management resources and compiles University of Arkansas, various USDA agency, and selected land grant university reports and publications to assist the state's producers.

Cooperatives – Developed an online module on the principles of cooperatives. The information is available through the University of Arkansas - Institute of Food Science and Engineering web site.

Extension Program Results and Accomplishments

Output Indicators

- 7,939 Number of total contacts reported related to management, marketing and/or farm policy.
- 106 Number of educational meetings held in which management, marketing and/or farm policy information was presented.
- 1,207 Number of participants attending educational meetings and receiving educational materials related to management, marketing, and farm policy.
- 100 Number of educational materials produced.

Outcome Indicators

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

Source of Funds

Smith-Lever 3b and 3c.

Agricultural economist received external funding from commodity promotions boards, USDA, Risk Management Agency and Cotton Incorporated.

Scope of Impact

Dissemination – Statewide availability of programs to interested counties. Management, marketing and farm policy information is available through UAEX web site.

Scope of Program – These programs have been delivered at some level in all 75 Arkansas counties.

Program Response: Harvest Equipment Selection, Maintenance and Fine-Tuning (Corn, Cotton, Grain Sorghum, Rice, Soybeans and Wheat)

Contact: Gary Huitink, Biological and Agricultural Engineering, 501-671-2242, ghuitink@uaex.edu

Situation

Soybeans and wheat have generated little profit in recent years for many growers in Arkansas. Some corn acreage has been seeded that was formerly in soybeans or cotton. Corn, cotton, grain sorghum, rice, soybeans and wheat are harvested by equipment that may cost more than \$300,000 for a new model. Making wise expenditures involves evaluating the harvester cost, the field capacity, field losses and the operator skills to maximize profit from cotton and grain production in Arkansas.

These harvesters are complex, and growers appreciate assistance with many aspects of cotton picker and combine technology. Challenges remain for growers to manage harvesting to improve their income, irrespective of commodity prices.

Stakeholder Input

Arkansas and Mid-South crop growers seek harvesting equipment selection and use guidelines. Growers seek unbiased information from the Cooperative Extension Service to make profitable decisions.

Overview

Consulting and education on aspects of grain and cotton harvesting are provided to crop producers. More research is needed to adapt current technology to typical Arkansas harvest situations. Consultation, field days, demonstrations and meetings provided growers practical techniques.

Extension Program Results and Accomplishments

Output Indicators

- Consultations and harvesting meetings.
- *Harvesting Grain Sorghum, Corn, Soybeans and Rice* are available from the CES web site and have been distributed to producers, providing advice on combine options, operation and field loss management.

Outcome Indicators

- Progressive growers are purchasing more rotary threshers and rasp bar combine threshers, based on research that better grain quality is possible with these options. Growers are inquiring about preferred equipment options and other management recommendations.
- County agents, consultants, growers and others are using harvest recommendations from CES publications, as well as consulting with Extension engineers on special harvest needs for corn, grain sorghum, cotton, rice, soybeans and wheat.
- Progressive growers plan their seeding and drying schedules to accommodate anticipated harvest schedules for their farm mix of corn, cotton, grain sorghum, soybeans and rice.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – This program is available through county extension offices throughout the area soybeans are grown in Arkansas. County agent and grower training and consultation were provided as requested. University of Arkansas Cooperative Extension Service publications with harvesting recommendations are available through county offices as well as guidelines on the Cooperative Extension Service web site.

Scope of Program – Most growers desire to use the costly harvesters in the best possible manner to retain grain and cotton quality and yield throughout the crop-growing areas of Arkansas. Other states have requested permission to copy our publications.

Program Response: Irrigation Scheduling Program

Contact: Phil Tacker, 501-671-2267, Biological and Agricultural Engineering

Situation

Arkansas' 4.5 million irrigated acres places it fourth in the country in irrigated acreage. Additionally, Arkansas continues to see an increase in irrigated acreage when irrigated acreage in other states is decreasing. Arkansas producers irrigate approximately 3 million soybean, cotton, corn and grain sorghum acres in order to increase and stabilize yields and quality and improve their potential for sustainability and profitability. These producers need a practical and effective method for scheduling irrigation.

Stakeholder Input

Personal communications with producers and county agents indicate that educational efforts in irrigation scheduling are needed. Many indicate personal experiences where irrigation scheduling has greatly enhanced crop yields and quality. Participating growers in Arkansas' Crop Research Verification Program consistently indicate that what they learn in the areas of irrigation management and scheduling greatly impacts their farm production. County Extension Councils and other advisory groups in the row crop producing counties recommend that Extension address this issue. Cotton Incorporated and the Soybean, Corn and Grain Sorghum Research Promotion Boards fund educational efforts related to irrigation scheduling.

Overview

Irrigation is becoming increasingly necessary for producers to achieve crop yields and quality that improve their sustainability and opportunity for profit. Limited water resources, increased energy costs and a limited labor source pose a challenge to properly scheduling irrigation to efficiently meet crop water demands. An Irrigation Scheduling Computer Program that is available through the Extension Service has proven to be a very helpful water management tool for producers. The program requires only a minimal amount of data input in order to project irrigation needs so the producer can better manage his irrigation water and labor to satisfy crop water needs and achieve desirable yields.

Extension Program Results and Accomplishments

Output Indicators

- 30 Educational meetings, tours, field days and workshops where information on irrigation scheduling was presented.
- 31 County Extension offices emphasizing irrigation scheduling in their educational efforts.
 - Irrigation scheduling program is downloadable from CES web page.

Outcome Indicators

- Five Experiment Stations using irrigation scheduling program.
- Five other states (Missouri, Kentucky, Tennessee, Mississippi, Louisiana) using irrigation scheduling program.
- Approximately 400 farms and/or producers using irrigation scheduling program.
- 34 fields enrolled in the Crop Research Verification Program using irrigation scheduling

program.

Source of Funds

Funding is from a combination of Smith-Lever Extension funds and grants from Cotton Incorporated and the state Commodity Promotion Boards – Soybean, Corn and Grain Sorghum.

Scope of Impact

Dissemination – Extension web site, educational meetings, field days/tours, field demonstrations, Crop Verification Program, conferences, seminars, workshops and Extension publications.

Scope of Program – The following row crop producing counties promote irrigation scheduling and the use of the Irrigation Scheduling Computer Program: Arkansas, Ashley, Chicot, Clay, Conway, Craighead, Crawford, Crittenden, Cross, Desha, Drew, Faulkner, Greene, Hempstead, Independence, Jackson, Jefferson, Johnson, Lafayette, Lawrence, Lee, Lincoln, Little River, Logan, Lonoke, Miller, Mississippi, Monroe, Phillips, Poinsett, Pope, Prairie, Pulaski, Randolph, St. Francis, White, Woodruff and Yell.

Program Response: Master Gardener Program

Contact: Janet B. Carson, Extension Horticulture Specialist, 501-671-2174, Horticulture

Situation

Gardening is the number one hobby in the United States. The majority of our county agents are not technically trained in horticulture and need assistance in their county in handling horticulture issues. In addition, our horticulture consumer population is becoming more urbanized. University of Arkansas horticulture specialists are establishing a base of trained volunteers to support our statewide programs, reaching an expanding and diverse audience.

Stakeholder Input

Feedback and requests are received from county agents and County Councils across the state.

Overview

The Arkansas Master Gardener program began in 1988. Over 5,200 Master Gardeners have been trained to date. In 2003, 604 new Master Gardener volunteers were trained, with 1,524 active Master Gardeners returning, giving us a total of 2,128 Master Gardener volunteers in Arkansas sharing their talents statewide. These Master Gardeners volunteered 74,623 hours in the state, and accrued 41,566 hours in educational hours. In dollar terms using a \$14.50 per hour rate, this had an impact of \$1,082,033.

These volunteers are making a strong impact on county programming, as well as county beautification. Volunteers help plant and maintain county property, libraries, schools and hospitals. They are active participants on county boards and commissions. They also work with consumers in their counties in various aspects, including working in the county office handling consumer calls, teaching workshops, working in demonstration gardens and participating in plant therapy programs, plant sales and school programs. In addition, most counties also produce excellent newsletters which are shared with county leaders in addition to the Master Gardener clientele.

To help spread the educational message, various mass media outlets are used. The Extension web site has been updated and is very user friendly, with vast amounts of horticultural information. Weekly newspaper articles and features, magazine articles, radio shows and a monthly television show, all add to the community outreach.

Extension Program Results and Accomplishments

Output Indicators

- 242 Number of educational publications, mass media and other materials produced as a means to disseminate new ideas to consumer clientele and other interested parties.
- 62 Number of educational meetings and demonstrations held to educate consumers.
- 265 Number of workshops on horticultural-related topics conducted to educate consumers.
- 3,458 Number of individuals attending educational meetings, demonstrations or workshops and receiving educational materials.

Outcome Indicators

- 942 Number of participants who report improved satisfaction from leisure gardening activities.
- 1,236 Number of participants who improved their home garden or landscape.
- These Master Gardeners volunteered 74,623 hours in the state, and accrued 41,566 hours in educational hours. In dollar terms using a \$14.50 per hour rate, this had an impact of \$1,082,033.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Arkansas. Available through web, publications, and media releases.

Scope of Program –

1. Master Gardener programs are in the following 50 counties: Arkansas, Baxter, Benton, Boone, Carroll, Clark, Cleburne, Columbia, Conway, Craighead, Crawford, Dallas, Desha, Faulkner, Fulton, Garland, Grant, Greene, Hot Springs, Independence, Izard, Jefferson, Johnson, Lawrence, Logan Lonoke, Madison, Marion, Miller, Monroe, Montgomery, Newton, Ouachita, Perry, Pike, Polk, Pope, Prairie, Pulaski, Randolph, Saline, Searcy, Sebastian, Sharp, Stone, Union, Van Buren, Washington, White, and Yell.
2. Multistate. AR, OK, LA, MS.

Program Response: Multiple Inlet Rice Irrigation

Contact: Phil Tacker, 501-671-2267, Biological and Agricultural Engineering,
ptacker@uaex.edu

Situation

Arkansas producers irrigate approximately 1.5 million acres of rice. Energy prices have increased, and the availability of irrigation water is declining in some rice-producing areas of the state. These factors, along with recent extended summer droughts and a declining labor force, have made it difficult for many producers to effectively flood irrigate their rice fields.

Stakeholder Input

Personal communications with producers and county agents indicate that educational efforts in improving rice irrigation water management are needed. County Extension Councils and other advisory groups in the rice-producing counties recommend that Extension address this issue. The Rice Research Promotion Board has funded educational efforts related to improving rice irrigation water management.

Overview

Extension promotes using Multiple Inlet Irrigation on rice for its improved water management that enables rice producers to irrigate more effectively and efficiently. Field demonstrations of Multiple Inlet Rice Irrigation (MIRI) indicate potential average water and energy savings of 25% and an average labor savings of approximately 30%. Field experiences also indicate that MIRI fields can be flooded quicker, which improves fertilizer and herbicide efficiency and is more environmental friendly. Field runoff is also potentially reduced, which can protect surface water resources and the environment. MIRI can also reduce the detrimental effect that cold water from irrigation wells has on plant development and yield.

Extension Program Results and Accomplishments

Output Indicators

- 30 Educational meetings, tours, field days and workshops where information on Multiple Inlet Rice Irrigation was presented.
- 30 County Extension offices emphasize MIRI in their educational efforts.
- 20 Counties with MIRI field demonstrations – 7 of the counties are either designated or pending designation as critical groundwater usage areas.
- 31 Producers involved in MIRI field demonstrations.
- 28 MIRI field demonstrations.

Outcome Indicators

Multiple Inlet Rice Irrigation (MIRI) Saves Energy, Water and Labor

Four rice producers cooperated with Extension to conduct field comparison studies on MIRI during the 2004 season. Following are the farms, the counties and the results.

- Daughette Farm, Crittenden County – used 23% less water during the season on MIRI field with clay soil.
- Jones Farm, Poinsett County – used 22% less water during the season on MIRI field on silt loam soil.
- Walls, Poinsett County – used 28% less water during the season on MIRI field on silt loam soil.
- Hall Farm, White County – used 2% less water during the season on MIRI field on silt loam soil.

Source of Funds

Funding is from a combination of Smith-Lever Extension funds and grants from the Rice Research Promotion Board.

Scope of Impact

Dissemination – Extension web site, educational meetings, field days/tours, field demonstrations, Crop Verification Program, conferences, seminars, workshops and Extension publications.

Scope of Program – The following counties emphasize MIRI in their educational efforts: Arkansas, Ashley, Chicot, Clay, Craighead, Crittenden, Cross, Desha, Drew, Faulkner, Greene, Independence, Jackson, Jefferson, Lafayette, Lawrence, Lee, Lincoln, Lonoke, Miller, Mississippi, Monroe, Phillips, Poinsett, Prairie, Pulaski, Randolph, St. Francis, White, and Woodruff.

Program Response:

Ornamental Horticulture Business Development

Contact: James A. Robbins, Extension Horticulture Specialist, 501-671-2307, Horticulture

Situation

Ornamental horticulture is one of the fastest growing segments of agriculture in the United States. The majority of our county agents are not technically trained in horticulture and need assistance in their county in handling horticulture issues. Existing ornamental horticulture businesses require training and exposure in new plants and production methods to stay competitive. Tremendous opportunities exist for new ornamental horticulture business in Arkansas, but these businesses require training and technical assistance.

Stakeholder Input

Input is collected as a standard operating procedure at all programs and events.

Overview

The commercial ornamental industry in Arkansas consists of a vast array of businesses that represent production, sales, and service sectors. General classes of business include garden center/retail, nursery production, greenhouse production, landscape installation

and maintenance, irrigation installation and maintenance, arborist, florist, sod production, sports turf and golf. Turfgrass related business is estimated at over \$200 million, nursery retail (not including mass merchants) at \$125 million, and landscape services at \$175 million. Nursery production, ranked at 32nd in the United States, is considered the sector with greatest growth potential. Access to major transportation lanes, reasonably priced agricultural land, labor, water, and other resources makes Arkansas a prime state for large-scale nursery production. Estimates indicate that 75% of plant material in Arkansas is imported from other states. Arkansas nursery products could also be exported to many states.

CES programs are designed to focus efforts on enhancing current ornamental horticulture businesses and to start new businesses. Programs, written materials and web materials are designed to support this goal. Thirteen new fact sheets have been developed since 1999, and a new quarterly newsletter has been initiated to convey information to counties and business clientele in a timely manner. A statewide plant evaluation program initiated in 1999 is designed to evaluate and help market “new” plant material for the Arkansas market. Reports and sources for this plant material are available on the CES web site. A statewide survey has been conducted to document the economic impact of the ornamental horticulture component of agriculture in Arkansas.

Extension Program Results and Accomplishments

Output Indicators

- | | |
|-------|--|
| 17 | Number of educational publications, mass media and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties. |
| 152 | Number of educational meetings, demonstrations, nursery and greenhouse visits or field days held to educate commercial clientele and other interested parties. |
| 5 | Number of workshops on fertility, production, post harvest, marketing and/or breeding and selection conducted to educate commercial clientele and other interested parties. |
| 5,780 | Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials. |

Outcome Indicators

- | | |
|---|--|
| 6 | Number of participants who adopted new production technologies. |
| 5 | Number of new commercial operations. |
| 5 | Number of participants who reduced their chemical and fertilizer inputs. |

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Available statewide through web, publications, and media releases.

Program Response: Ornamental Plant Evaluation

Contact: Gerald Klingaman, Extension Horticulturist - Ornamentals, 479-575-2604,
Horticulture

Situation

New plants are a major driving force in the ornamental plant industry. Not only do nursery and greenhouse producers need to know about how ornamental plants perform in Arkansas, so do consumers. The plant evaluation program focuses on evaluating annual, perennial and greenhouse crops, especially poinsettias.

Stakeholder Input

Contact with industry leaders through attendance at state and regional trade shows, periodic visits and personal contacts provide information on the pulse of the industry. Contact with consumers through the Master Gardener program, the Arkansas Flower and Garden Show and various county meetings provide feedback from this segment.

Overview

The ornamental industry in Arkansas is primarily composed of small, single location firms that service a local clientele base. The retail nursery/greenhouse base has an estimated value of \$125 million, not including mass-market sales. Texas has estimated that 80% of the ornamentals found in that state move through mass-market outlets. If this were true in Arkansas, mass-market sales would amount to \$500 million and total ornamental retail sales at \$625 million. The landscape services industry, which uses the ornamental plants being evaluated, has a retail sales value estimated to be \$175 million. Wholesale production figures have been estimated at around \$50 million. Providing ongoing evaluation of new plants as they enter the market stream is a way of providing direct support for the producer, the retail ornamental industry and the consumer.

Extension Program Results and Accomplishments

Output Indicators

- The Horticulture Display Garden at the University of Arkansas has evaluated over 850 annuals and perennial plants since it was established in 1998. Greenhouse evaluations have been conducted for poinsettias with over 120 cultivars evaluated in the past three years. Trials have been conducted on garden mums, asters and assorted perennial plant groups.
- The results from these evaluations are reported at state and regional meetings and in publications such as the Horticulture Report series published by the Horticulture Department. A monthly greenhouse column in a national publication also provides ongoing updates of the program findings.
- Consumer output is provided by an ongoing series of newspaper releases called “Plant of the Week” which appears in about 20 newspapers throughout Arkansas and is also published on the Extension Home and Garden web site. The Arkansas Select program is an extension of the plant evaluation program.

Outcome Indicators

- 52 Number of different plant related articles published for use in newspapers and the Extension web sites Arkansas Select leaflets distributed to perspective consumers.
- 3,427 Attendance at talks given during the plant discussing plant selection.

Source of Funding

Smith-Lever 3-b and 3-c, plant contributions from greenhouse firms.

Scope of Impact

New plants continue to drive the growth of the ornamentals market. Providing information on plant performance under Arkansas conditions helps continue the growth of the industry.

Dissemination – Arkansas and surrounding states; nationwide through monthly greenhouse column.

Program Response: Poultry Short Course

Contact: Dr. Frank T. Jones, Extension Poultry Specialist, 479-575-5443,
ftjones@uark.edu

Situation

Although many consume the products produced by the poultry industry, few understand the production system.

Stakeholder Input

Numerous calls requesting short-term poultry training are received annually.

Overview

A comprehensive short course program was established. The program included lectures on the components of a poultry production system from breeders through further processing, as well as tours of operating commercial production and processing facilities.

Extension Program Results and Accomplishments

Output Indicators

- 1 Short course program conducted.
- 21 Presentations on poultry production provided by faculty.

Outcome Indicators

- 10 Allied industry leaders learned about the poultry industry.
- 2 Popular press articles as a result of the short course.

Source of Funds

Smith-Lever, course registration fees.

Scope of Impact

Dissemination – The short course program is available to any interested party.

Scope of Program – The program is presented in Arkansas.

Program Response: Soil Fertility and Plant Nutrition Education and Applied Research Program

Contact: Dr. Leo Espinoza, Extension Agronomist - Soil, 501-671-2168,
lespinoza@uaex.edu

Situation

There has been a significant increase in average yields for most commodities grown in Arkansas. This increase has been, in part, a result of the introduction of improved hybrids and cultivars developed by public and private breeding programs. These new varieties and hybrids tend to respond dramatically to added inputs, with fertilizer being one of them. In consequence, there is a need to fine-tune and, if needed, modify existing fertilizer recommendations, so Arkansas producers are able to maximize the yield potential of all commodities. The increasing cost of chemical fertilizers and increasing environmental concerns require that farmers maximize their fertilizer use efficiency, so they are able to increase or maintain their productivity while maintaining environmental liability.

Low organic matter content of Delta soils is the probable cause for the common occurrence of some nutrient deficiencies, in addition to the use of irrigation water with an alkaline pH. Low organic matter is also a contributing factor in surface compaction (crusting) in many Arkansas soils. The presence of micronutrient deficiencies and the formation of a crust can significantly affect optimum crop production.

Stakeholder Input

The County Agriculture Council is one of the avenues for the identification of research and educational needs, with feedback collected at their annual meetings being the basis for most of the programs developed by counties and communicated to specialists via the county Extension agents. Feedback is also obtained from the official policy on state issues approved by county delegates to the Arkansas Farm Bureau annual convention. Additionally, the Promotion Boards for each commodity have identified the need to constantly revise fertilizer recommendations, with funds allocated to address such needs.

Overview

The most significant issues relevant to this program response include:

- **Soil Fertility and Plant Nutrition** – Soil testing is the foundation of a sound fertility program. Every year nearly 100,000 soil samples are received at the Soil Lab at Marianna. Fertilizer recommendations are included with the majority of the soil test reports. Soil testing not only provides a guide to develop fertilizer recommendations for the intended

crops, but also, together with plant analysis, can aid in the identification of potential problems.

- **Soil Quality** – The continued loss of organic matter through surface erosion is probably one of the reasons for the increased occurrence of nutritional deficiencies. Soil crusting, an increasing problem on silt loam soils, is accentuated by the lack of organic matter. Soil crusting can significantly reduce plant emergence, resulting in the need to replant entire fields with costly seed.
- **Reducing Production Costs/Increasing Productivity** – The increasing cost of chemical fertilizers, especially those containing nitrogen, is a major concern for farmers growing crops that have a high nitrogen requirement.
- **Response to Emerging Issues** – During every growing season, there are nutritionally-related issues that can potentially affect the yield potential of crops grown in Arkansas. Such issues have included boron deficiencies in soybeans, sulfur deficiencies in cotton, and zinc deficiencies in corn.

Extension Program Results and Accomplishments

Output Indicators

- Arkansas soybean producers can potentially reduce yield losses by 20 bushels, if they follow Extension recommendations for soybean growing in areas affected by a boron deficiency.
- Arkansas grain sorghum producers could potentially increase their dryland yields by up to 40 bushels if they follow Extension's fertility and irrigation recommendations.
- Nearly 1,500 copies of the Grain Sorghum Production Handbook were produced and distributed to producers.
- More than 1,000 Arkansans received information on soil testing, and best management practices for lime and fertilizer application and plant analysis, via production meetings in 2004.
- Nearly 100 Arkansans were trained in soil fertility within the Master Gardener program.

Demonstrations

- 4 Cotton fertility demonstrations
- 2 Wheat fertility demonstrations
- 2 Soybean fertility demonstrations
- 4 Corn fertility demonstrations

Educational Meetings

- 14 Production Meetings
- 3 Staff trainings

5 Field Day/Crop Tours

Applied Research Studies

- 4 Grain Sorghum (irrigated) fertility trials
- 4 Grain sorghum (dryland) fertility trials
- 2 Cotton no-till trials
- 2 Cotton fertility trials
- 1 Corn no-till trial
- 5 Corn fertility trials
- 1 Soybean no-till trial
- 3 Soybean fertility trials
- 2 Wheat fertility trials

Outcome Indicators:

- 550,000 acres of soybean were sampled and provided with fertilizer and lime recommendations. This represents nearly 15% of the total soybean acres planted in 2004.
- 185,000 acres of cotton were sampled and provided with fertilizer and lime recommendations. This represents nearly 20% of the acres planted in 2004.
- 96,000 acres of rice were sampled and provided with fertilizer and lime recommendations. This represents nearly 7% of the acres planted in 2004.
- Nearly 180,000 acres of pastures were provided with fertilizer and lime recommendations.
- 40,000 acres of corn were sampled and provided with fertilizer and lime recommendations. This represents nearly 15% of the acres planted in 2004.
- 20,000 acres of grain sorghum were sampled and provided with fertilizer and lime recommendations. This represents nearly 30% of the acres planted in 2004.
- Nearly 300 soil and tissue samples were received for diagnostic purposes. Assistance was provided to those samples that required further consideration.

Source of Funds

Funds were obtained from The Soil Test and Research Board, The Corn and Grain Sorghum Promotion Board, Cotton Incorporated, and from seed and chemical companies and Extension (Smith-Lever Act). Direct funding to conduct applied research totaled over \$60,000, with “in-kind” donations totaling nearly \$20,000.

Scope of Impact

Dissemination – Information is disseminated to any interested party through, mail, e-mail, Extension publications, personal communications, producer meetings, conferences and seminars, and by annual reports to the commodities' Promotion Boards

Scope of Program – The Soil Fertility and Plant Nutrition Education and Applied Research Program aims at serving all counties in the state of Arkansas, whether they are row crop or pastures producers, vegetable or fruit growers. Fertility research, demonstration and/or educational activities were conducted in the following counties: Crittenden, Cross, Desha, Greene, Lafayette, Jefferson, Lee, Saline, St. Francis, Poinsett, Mississippi, and Lonoke.

Program of Excellence

Teamwork to Solve a Fertility Problem

In 2004, Southeast Arkansas received rainfall during 22 days in the month of June. Several cotton growers in Desha County were concerned about the loss of already applied fertilizer, particularly nitrogen, and the inability to apply the recommended rate. County agents organized a tour of affected fields, conducted an evening meeting with affected growers and Extension specialists, and facilitated the development of a plan of action. Petiole samples were offered as a tool to diagnose the crop's nutritional status. With the collaboration of the soil test lab at Marianna, samples were analyzed in only 24 hours, which allowed Extension specialists to provide possible solutions to the problem in a very short time.

General Program Information – Each season, county agents inform Extension specialists about emerging issues in their respective counties, issues that can potentially impact optimum crop growth. Extension specialists and research faculty take the necessary steps to address such issues in a timely fashion. In this particular instance, county agents and research and Extension faculty worked together to find a solution in a very short time frame.

Location – This success story highlights the Desha County program.

Impact Numbers – An area that includes nearly 75,000 acres of cotton in Desha County was affected by the erratic weather patterns experienced during the 2004 growing season. A significant percentage of the expected yield was secured due to the prompt action of county agents and Extension specialist.

CES Section Contact Person – Leo Espinoza, Extension Agronomist - Soils, 501-671-2168, lespinoza@uaex.edu.

Program Response:

Technology Transfer and Applied Research in Feed Grains

Contact: Dr. Jason P. Kelley, Extension Agronomist - Wheat and Feed Grains, 501-671-2164, jkkelley@uaex.edu

Situation

Arkansas wheat producers harvested 620,000 acres in 2004, with an average yield of 53 bu/acre. Harvested wheat acreage increased 50,000 acres and yields increased 3 bu/acre from the previous year. Wheat continues to be a profitable crop for many producers, especially on acres where irrigation of row crops is not possible. A majority of wheat in the state is grown in a double crop rotation, following corn, grain sorghum, soybean, cotton, or rice. Arkansas wheat producers are always looking for management practices to reduce production costs and still be able to produce economical high-yielding wheat. Corn acreage in the state continues to increase, with 305,000 acres harvested in 2004 compared to the 10-year average of only 187,000 acres harvested. Corn yields continue to increase and have been averaging about 3 bu/acre increase each year over the last 20 years. State average corn yield in 2004 was 140 bu/acre. Corn acreage expansion will likely continue over the next few years as more producers recognize the rotational benefits of corn. Grain sorghum acreage was down in 2004 from previous years with 56,000 acres harvested for grain. This decrease was primarily due to high prices for other commodities prior to planting. Grain sorghum yields have continued to increase for the past several years. The state average grain yield in 2004 was 84 bu/acre, compared to the 10-year state average yield of 75 bu/acre. Grain sorghum acreage will likely expand in 2005 with depressed prices for other commodities and the possibility of soybean rust. Educational programs addressing cultivar/hybrid selection, soil fertility requirements, production practices, timing of inputs, crop rotation benefits, and irrigation timing were key factors involved in the increasing grain yields that were seen in the state this past year.

Stakeholder Input

County educational meetings are planned based on input from county agriculture councils, county Extension agents, and wheat, corn, and grain sorghum producers in the county. County research and demonstrations are planned with input from producers and county extension agents and are designed to provide information on aspects of production where information is needed. In addition, Extension was called upon to deal with emerging issues of 2004 that were unforeseen and had to be dealt with through impromptu educational programming as the crop season progressed.

Overview

The most significant issues facing our clientele include:

Variety/Hybrid Selection: In 2004, 100 wheat varieties, 104 corn hybrids, and 51 grain sorghum hybrids were tested in the Arkansas Variety Testing Program. This represents only a portion of varieties/hybrids that are on the market today. As the number of varieties/hybrids available increases each year, producers are always looking for non-biased variety testing information. Producers are often challenged by the large volume of varieties/hybrids available to find varieties/hybrids that will perform well on their farm. Roundup Ready corn acreage continues to expand in the state. Economic decisions on whether to plant Roundup Ready or Conventional corn will have to be made.

Fertility and Tillage System Management: Nitrogen fertilizer is the largest production input for wheat, corn, and grain sorghum in Arkansas. Fertility practices need to be evaluated to ensure our recommendations are keeping pace with our ever-increasing crop yields. Many producers are reducing tillage to keep input costs down. Research addressing fertility needs in reduced tillage cropping systems needs to be evaluated. Micronutrient fertility in corn, specifically zinc and sulfur, needs evaluation.

Weed Management: Italian ryegrass continues to challenge economical wheat production in some areas of the state.

Ways to Reduce Production Expenses: Inputs such as diesel and nitrogen have drastically increased this year. Techniques to reduce input costs without sacrificing yields are needed.

Extension Program Results and Accomplishments

Output Indicators

- 11 Wheat fields enrolled in the Wheat Research Verification Program.
- 8 Wheat field tours of demonstrations and/or varieties.
- 13 Wheat county production meetings.
- 1 Publication on wheat variety selection.
- 1 Arkansas Wheat Newsletter.
- 8 Corn fields enrolled in the Corn and Grain Sorghum Research Verification Program.
- 7 Corn field tours of demonstrations and/or hybrids.
- 20 Corn county production meetings.

- 1 Publication on corn hybrid selection.
- 2 Grain sorghum fields enrolled in the Corn and Grain Sorghum Research Verification Program.
- 16 Grain sorghum county production meetings.
- 1 Publication on grain sorghum hybrid selection.
- 10 Popular press articles or interviews.
- 3 County Extension agent trainings.

Applied Research

- 3 Corn production practices
- 2 Corn and wheat fertility
- 14 Grain sorghum production practices
- 2 Wheat weed control
- 1 Wheat production practices

Outcome Indicators

Wheat: Arkansas continues to be a leader in production of soft red winter wheat in the United States and was ranked 15th nationally in the production of winter wheat. Arkansas wheat farmers harvested 620,000 acres of wheat, averaging 53 bu/acre, in 2004. The Wheat Research Verification Program (WRVP) included 11 fields in the 2003-04 wheat season. The fields were located throughout the state. Fields enrolled in the WRVP averaged 62.2 bu/acre, nearly 10 bu/acre greater than the state average. The WRVP fields served as sites for several county field days and demonstrations. These field days and demonstrations helped researchers, specialists and agents focus on problems associated with wheat production in Arkansas.

Corn: Arkansas continued to expand corn acreage in 2004. Nationally, Arkansas was ranked 26th in production of corn in the United States. Arkansas producers harvested 305,000 acres of corn in 2004 with an average yield of 140 bu/acre. The Corn Research Verification Program was conducted on 7 fields. The average yield was 158 bu/acre, 18 bu/acre greater than the state average yield. The Corn Research and Verification Program fields served as an educational tool for many people including county agents, producers, and research and extension personnel from many disciplines, including Plant Pathology, Entomology, Agronomy, and Bio-systems and Agriculture Engineering. Corn borer moth traps were located at several fields to help monitor and implement control measures. In addition, weather-monitoring stations were located at verification fields that supplied

critical data to the irrigation-scheduling program to determine when irrigation water was needed.

Grain Sorghum: Arkansas grain sorghum producers harvested 56,000 acres with an average yield of 84 bushels per acre. In 2004, Arkansas was the 10th leading state in the production of grain sorghum in the United States and had the 6th highest state average grain yield. Two Grain Sorghum Research Verification Fields were established in 2004. The fields averaged 114 bu/acre, 30 bu/acre greater than the state yield average. Throughout Arkansas, grain sorghum is an attractive crop for many producers who are looking for a drought tolerant crop to grow on dryland acres and in fields where root-knot or soybean cyst nematode levels are high and causing yield losses to other row crops.

Source of Funds

County programs are funded by IPM and Smith-Lever Act funds. The Wheat Research and Verification and Corn and Grain Sorghum Research Verification Programs are funded by the Arkansas Wheat and Corn and Grain Sorghum Promotion Boards. Funding for the verification programs was in excess of \$125,000 for 2004. Funding for applied research was supplied by the Arkansas Corn and Grain Sorghum Promotion Board and totaled over \$20,000. In-kind support for the Wheat and Feed Grains project from industry totaled greater than \$13,000 in 2004.

Scope of Impact

Dissemination – Information is disseminated to any interested party through e-mail, personal communication, producer meetings, postal mail, conferences, seminars, and field tours. Newsletters were distributed to update clientele on crop status and any concerns. Crop performance information collected from variety/hybrid testing programs is distributed yearly. Promotion Board reports were also made available through the Extension web site.

Scope of Program – All wheat, corn, and grain sorghum producing counties in the state.

Programs of Excellence

Replant or Keep Flooded Corn

2004 was a year when many Jackson and Independence County corn producers were faced with some difficult decisions about their flooded corn crops. Many acres of corn were planted in the White River bottoms that flood when heavy rains occur. Prolonged heavy rains in mid-April caused extensive flooding, and many acres of corn were flooded. Randy Chlapecka and Stan Carter, Jackson and Independence County Extension agents, were getting numerous phone calls from producers who were wondering whether their flooded corn was going to survive. Randy and Stan organized a tour of the flooded

corn in the counties to determine what appropriate actions should be taken. After visiting corn fields in the counties and visiting with producers, it was determined that many acres that had been under water for less than three days would survive. This information was passed on to corn growers in the counties. Approximately 1,000 acres of corn that flooded were saved from replanting or being destroyed and planted to another crop.

General Program Information – County Extension agents organize emergency meetings when farmers in their respective counties face problems that can potentially reduce expected yields. In this case, flooded corn was an issue of concern for farmers in Jackson and Independence counties.

Locations – This success story highlights the Jackson and Independence County programs.

Impact Numbers – Corn from 1,000 acres was not replanted and yields were high. Savings to Jackson and Independence County corn producers was in excess of \$50,000 in seed costs alone.

CES Section Contact Person – Jason P. Kelley, Extension Agronomist - Wheat and Feed Grains, 501-671-2164, jkelley@uaex.edu

Corn and Grain Sorghum Research Verification Programs

The Corn and Grain Sorghum Research Verification Program (CGSRVP) has far-reaching benefits to Arkansas corn and grain sorghum producers. The CGSRVP continues to be a valuable educational tool to teach Arkansas producers and county Extension agents the latest recommendations for producing economical high-yielding corn and grain sorghum. Through weekly field visits, the verification coordinator and county Extension agent monitor the crop closely and recommend to the producer what timely management decisions need to be made. The producer then can see firsthand what problems are encountered and learn what needs to be done.

A shining example of the success of the verification was seen this year. Denny Peterson grows corn on clay loam soils near Lewisville, Arkansas. He has been growing corn only four years, and his yields on the heavy soils were less than what he was hoping for. His fertilization program was not what it should have been to produce acceptable yields. Nitrogen fertilizer rates were too low and soil P levels needed supplementation to produce high yields. A field of Denny's was enrolled in the corn verification program in 2004. Through the verification program, Denny was able to improve his production practices through a more balanced fertility program and better weed management. The verification field yielded 170 bu/acre dryland in 2004 and had the lowest production costs and highest profit of the seven corn fields enrolled in the verification program in 2004.

Location – 9 counties, including Chicot, Desha, Lafayette, Little River, Miller, Monroe, Woodruff, Prairie, and Lincoln.

Impact Numbers – In 2004, 7 corn and 2 grain sorghum fields were enrolled in the CGSRVP. Corn and grain sorghum yields were 18 and 30 bu/a greater than the state average yields. At state average prices, corn and grain sorghum total returns averaged \$36 and \$60/acre greater in verification fields than state average fields.

CES Section Contact Person – Jason P. Kelley, Extension Agronomist - Wheat and Feed Grains, 501-671-2164, jkelley@uaex.edu

Program Response: **Technology Transfer for Sustainable Rice Production**

Contact: Dr. Charles E. Wilson, Jr., Extension Agronomist – Rice, 870-673-2661, cwilson@uaex.edu

Situation

In 2004, rice was grown on 1.55 million acres with an estimated average yield of 6,910 lbs/acre (154 bushels per acre). Rice acreage increased almost 7% from the 2003 acreage. The estimated 2004 state average yield is the highest average yield on record, surpassing the mark established in 2003 by nearly 7 bushels/acre. The record marks the fourth consecutive year that record yields have been achieved. The record yields can be attributed to improved varieties, improved management practices, and favorable weather during critical times during the growing season. The 2004 crop marked the second time in as many years that reasonably good prices have been matched with excellent yields. However, Arkansas rice producers continue to face many challenges in order to produce a profitable crop and maintain sustainability of the land. The most significant issues include optimum variety selection, diminishing irrigation water quantity, integrated pest management issues, nutrient management, and soil conservation.

Stakeholder Input

County educational meetings are planned based on input from county councils made of rice producers in each county, to ensure that the topics that are covered are relevant to the producers in each particular county. Planning sessions were conducted with consultants and other industry personnel to discuss educational issues relevant to their needs. Research and demonstration projects are coordinated similarly, by implementing projects geared to the needs of the producers for each county. A survey was conducted among growers, consultants, and county Extension agents regarding the priorities for rice research and extension programs.

Overview

Arkansas rice producers continue to face many challenges in order to produce a profitable crop and maintain sustainability of the land. The most significant issues facing our clientele include:

- **Variety Selection and Cultural Management** – While conventional varieties continue to dominate the rice acreage in Arkansas, new technology such as hybrid rice and herbicide-resistant rice are entering the market and may be a significant contributor to overall productivity. Production decisions must be addressed to economically produce these varieties. Variety selection programs are being developed to assist growers in making better decisions based on field-specific situations. Improved cultural management decisions include optimum seeding rates, optimum seeding dates, and tillage practices.
- **Soil and Water Conservation** – Rice production accounts for the majority of groundwater used for agricultural production in Arkansas. Arkansas has declared 11 counties as critical relative to groundwater depletion and has several more counties that are targets for future concern. Decisions should be made in order to continue to produce rice profitably and conserve the valuable water supply necessary for production of this crop. Educational and research programs aimed at helping producers utilize means of conserving water while maintaining productivity are ongoing. Conservation tillage continues to be a valuable tool and focus program for rice producers. The potential to reduce costs while decreasing soil and nutrient runoff is great.

Integrated Pest Management

- New technology has been released for controlling red rice, the number one weed problem in Arkansas rice fields, directly in the rice crop. Clearfield rice was produced on approximately 16% of the rice acreage in Arkansas and is expected to exceed 20% of the acreage in 2005. New challenges, such as outcrossing that results in Newpath-tolerant red rice, will be a significant issue.
- Icon, the only registered product for grape colaspis, will soon be unavailable. Grape colaspis larvae will cause a significant amount of stand loss in the Arkansas rice crop if uncontrolled. While new products are under development, education is underway to help growers utilize cultural management strategies to reduce the risk of this pest.
- Rice disease problems, particularly sheath blight, panicle blight, and rice blast, continue to be a problem, causing yield and quality reductions. Variety selection, best production management practices, field scouting, and informed decisions regarding fungicide applications are all part of the educational approach to managing these diseases. Field observations and subsequent research has confirmed that a race of rice blast may compromise the utility of our current blast-resistant rice varieties. Management decisions become increasingly important until better blast-resistant varieties can be developed.

Nutrient Management

- Nitrogen fertilization, one of the most expensive inputs into the rice crop, has been a problem in much of the state but particularly in areas where rice is produced on clay soils. Improving pre-flood nitrogen efficiency is a challenge to maximize yields and balance disease development.
- A better understanding of zinc fertilization on clay soils is needed.
- Refining optimum K fertilizer recommendations for rice production in Arkansas continues to be a significant issue. Late-season symptoms continue to be observed in highly-productive rice fields.
- Increasing the understanding of best management practices for utilizing poultry litter in production rice fields as a nutrient source is needed. With the need to dispose of several thousand tons of poultry litter in Northwest Arkansas, much interest has been expressed in utilizing the litter as a fertilizer source for row crops in Eastern Arkansas.
- Strengthening the current database of soil test calibration experiments to support current fertilizer recommendations is a current need.

Extension Program Results and Accomplishments

Output Indicators

In efforts to meet the needs of clientele, the following were implemented in 2004:

Demonstrations

- 10 Rice Research Verification
- 3 Variety Performance
- 4 Seeding Rates
- 2 Agrotain Urea Stabilizer
- 1 Phosphorus Fertilization
- 3 Poultry Litter Applications
- 20 Nutrient Diagnosis/Fertilizer Response
- 3 Weed Control
- 4 Rice Disease Management

Educational Meetings

- 30 County Production Meetings
- 6 IPM Meetings
- 12 Field Day/Crop Tours
- >100 Field Visits with Producers

Applied Research Studies

- 2 DD50 Threshold Development
- 4 Seeding Date Studies
- 3 Optimum Row Spacing
- 2 Seeding Rate Studies
- 2 Irrigation Termination Timing
- 1 Simulated Hail Injury

Outcome Indicators

Arkansas harvested 154 bushels of rice per acre from 1,555,000 acres for a total production of 107 million cwt in 2004. Arkansas is consistently among the leaders in the U.S. in rice production, ranking first in acreage and production. Arkansas also ranked second in average yield in 2004, second only to California.

Arkansas ranks first in acreage and total production, producing just over 48% of the U.S. crop. Arkansas’ rice is generally valued at over \$765 million annually.

Approximately 4,000 farms in Arkansas produce rice, 94% of which was dry seeded, 39% utilizing conservation tillage, and 28% utilizing multiple inlet rice irrigation. Conservation tillage practices have increased slowly over the last 10 years. Adoption of the multiple inlet rice irrigation has increased about 5% each year for the past 5 years. Precision leveling continues to increase each year, with approximately 40% of the rice produced on precision-leveled soils. These shifts benefit producers by reducing costs and conserving soil and water. Thus, it improves productivity as well as the environment.

The University of Arkansas Cooperative Extension Service rice educational program provided farmers with current recommendations on variety selection, fertility management, pest control (disease, insect and weed), cultural practices, water management, and stored grain management. Rice educational information was disseminated through county and area production meetings, county field days and turn row meetings, the DD50 rice management computer program, fact sheets, the *Rice Production Handbook* (MP192), soil testing and fertilizer recommendations, and county and Agricultural Experiment Station field days. Production demonstrations and replicated applied research studies were conducted in grower fields and at four Agricultural Experiment Stations. Extension rice publications and applied research results were available on the Extension Crop, Soil, and Environmental Sciences section web site in 2004, allowing growers to review information at any time from their homes.

A summary of county Extension programs during the 2003-2004 year showed that in excess of 12,000 contacts were made in the dissemination of information from county grower meetings, field days, and Extension publications/newsletters.

Rice producers are using the Rice DD50 Program and other tools in an IPM program to better time cultural practices including herbicide timing, fertilization timing, flood management, insect scouting and insecticide application timing, disease scouting and fungicide application timing, as well as irrigation timing and harvest timing. The 2004 Rice DD50 program was used by 1,543 producers on 9,393 fields representing 672,841 acres. The DD50 program was updated to include information for five new varieties and hybrids and several new research-based recommendations to growers concerning fertilization and disease control. The DD50 now supports 58 varieties, 27 management decisions, and includes disease susceptibility ratings for each rice variety. The program was converted to a web-based program in 2003 to allow producers direct access at their convenience.

Rice production in Arkansas is currently dependent upon public breeding programs. Wells, a cultivar released by the University of Arkansas Agricultural Experiment Station, was grown on 40% of the state's acreage. Rice varieties developed by the University of Arkansas were planted on over 50% of the acreage in Arkansas, including Wells (39.9%), Francis (11.4%), LaGrue (0.8%), Ahrent (0.9%), and Drew (0.7%). New herbicide technology, specifically the Clearfield rice production system, has allowed producers to grow rice that had previously been unprofitable due to heavy infestation of red rice. Clearfield rice was produced on approximately 16% of the Arkansas rice acreage, contributing to increased yields and quality by reducing the negative yield and quality impact of red rice. This acreage primarily consisted of one variety (CL 161, 13.2%) and one hybrid (Rice Tec CL XL8, 2.5%). Other varieties supported by the DD50 program that were grown in Arkansas, including the percentage of the 2004 rice acreage, were Bengal (10%), Cocodrie (15%), Cypress (1%), and Rice Tec XL8 hybrid (1%).

Soil testing is a fundamental aspect of sound nutrient management. Soil samples analyzed by the University of Arkansas Soil Testing Laboratory for rice soils totaled 9,785 representing 1,074,967 acres. This represents 69% of the rice acreage in Arkansas in 2004. Water analysis is provided to farmers who are potentially facing problems with water quality. During 2004, 93 producers utilized water testing to determine the impacts of utilizing this water for irrigation. This represented approximately 40,000 acres.

Applied research was conducted on new conventional varieties (Banks, Cybonnet, Medark, Cheniere), conventional hybrids (XP 710, XP 712, XP 716, XP723) and with herbicide resistance technology (CL XL8) to develop DD50 thresholds for the 2005 DD50 program and University recommendations for production practices. The RICESEED computer program was updated in 2004 to include new varieties, updated seed weights, and can be run from the Internet. This program was utilized by 100 producers representing 32,000 acres in Arkansas during 2004.

The RRVP was implemented in 1983 to verify the recommendations of the University of Arkansas Cooperative Extension Service in commercial rice. The program is implemented by cooperating with producers in the county who are willing to allow

Extension personnel to make management decisions based on conditions in the field. This program worked directly with producers in 11 counties during 2004. Multiplier fields were also conducted by agents in several counties, involving several producers. Yields in the Rice Verification Program averaged 171 bushels per acre in 2004, approximately 17 bushels better than the statewide average of 154 bushels per acre. Net income for these fields averaged \$178 per acre.

Source of Funds

County programs are funded by IPM and Smith-Lever 3b and 3c funds. The Rice Research Verification Program, applied research and demonstrations, and seminars/meetings are funded by external sources such as industry grants and Rice Grower Check-off funds administered by the Arkansas Rice Research and Promotion Board. Direct external funding totaled more than \$350,000 and in-kind contributions totaled more than \$5,000 for the rice Extension program.

Scope of Impact

Dissemination – Information is disseminated to any interested party through mail, Extension web sites, personal communications, Extension publications, news media, and producer meetings, seminars, and conferences. Publications and Extension support materials developed include:

- 1 Rice Information Sheets
- 4 Fact Sheets
- 15 Newsletters
- 7 Web-based Educational Materials
- 9 Articles in Research Bulletins
- 10 Other Educational Materials
- 3 Individual Articles
- 37 Article Interviews
- 5 Television and Radio Interviews
- 2 Computer Software
- 3 Teaching Aids

Scope of Program – The majority of the rice program is state specific and directed to Arkansas rice producers. The program impacts at least 35 of the counties in Arkansas. Rice producing counties include Arkansas, Ashley, Chicot, Clark, Clay, Conway, Craighead, Crawford, Crittenden, Cross, Desha, Drew, Faulkner, Greene, Independence, Jackson, Jefferson, Lafayette, Lawrence, Lee, Lincoln, Little River, Lonoke, Miller, Mississippi, Monroe, Philips, Poinsett, Pope, Pulaski, Prairie, Randolph, St. Francis, Woodruff, and White counties. This program impacts all counties in Arkansas where rice is produced. Multi-state Integrated Research and Extension efforts exist between Mississippi, Missouri, Louisiana, and Texas for variety testing, integrated pest management recommendations, and nutrient management.

Programs of Excellence

Scouting Equals Success

A local rice producer in Craighead County agreed to participate in the rice verification program in hopes of improving his rice yields. His previous best yields were 150 bu/A. The first year in the program, his yield increased from 150 bu/A to 184 bu/A. The second year in the program, his yields were 191 bu/A. Through soil testing, a pH problem was discovered that was limiting his yields. Adjustments to seeding rate (lowered) and timing of fertilizer applications were made. Disease scouting techniques were taught, and in both years the fields needed to be treated for disease, but with lower fungicide rates recommended by the company. The fields were also monitored using rice water weevil traps as demonstration and research tools. Increased yield, increased bottom-line earnings by reducing input costs, and education on general production practices and pesticide scouting procedures were among the direct benefits. A minimum of 6 producers who farm in the immediate area of the verification field were able to observe the first year results. During the second year, some of the same production practices were implemented on their farms. The producer learned more efficient ways to apply fertilizer, as well as learning the importance of soil sampling. Producers in close proximity to the verification fields have adopted some of the practices demonstrated in the verification field.

Rice Educational Programs Yielding Results

A large part of the rice acreage in Lincoln County is grown on high pH, clay soil. Yields on this type of soil have been erratic from year to year and from field to field in the same year. Currently, there is little research being conducted on this type of soil. In years past, farmers have been increasing nitrogen fertilizer rates in an effort to increase yields. In some cases this has worked and not in others. Experiencing these types of problems after the 2001 crop year, Mr. Johnny McGraw requested assistance from Extension in increasing his rice yields. Approximately 80% of his rice acreage is on high pH, clay soil. In an effort to research this type of rice production and educate producers on production practices for maximizing yields, several educational demonstrations were conducted over the past three years. As a result of the demonstrations, the cooperator, Mr. Johnny McGraw, increased his rice yields by 30 bushels per acre during 2004 as compared to 2003. In 2002, Mr. McGraw agreed to enroll in the Rice Research Verification Program (RRVP). The goal of the RRVP is to maximize returns (increased yields/decreased inputs) by educating producers on Extension's recommended researched-based production practices. In 2003, a rice variety trial and variable nitrogen fertilizer rate study were conducted on his farm in an effort to select the best-performing varieties and fine tune his nitrogen fertilization rates. In 2004, as required by RRVP, he again enrolled the same field in the RRVP. In addition, another variety trial and nitrogen study were conducted.

From 2001 to 2004, the RRVP field average yield has increased by 35 bushels per acre while input costs have decreased \$25 per acre. With the USDA loan price on rice of \$2.97 per bushel, Mr. McGraw realized a \$103.95 per acre increase in gross profits just from increased yields in the RRVP field. By adding the savings from the decreased input costs, he realized a total increase in gross profits \$128.95 per acre. In addition, by selecting varieties that performed well in the variety trial conducted in 2003 and implementing production practices learned from the 2002 and 2004 RRVP, Mr. McGraw increased his average rice yield by 30 bushels per acre across his entire 1,700 acres of rice. Again, with the USDA loan price, that is an increase of \$89.10 in gross profits per acre, or a total increase in rice gross profits of \$151,470.00. According to Mr. McGraw in 2004, "This is the best rice crop we have ever cut." Mr. McGraw and several other surrounding farmers now know there are real variety differences on this type of soil. In addition, producers now know there are some things they can do other than apply more nitrogen to increase yields.

County Rice Verification Program Successful Again

Producers often need some fine tuning on their production of a crop. While they are good producers, sometimes they can improve their production efficiency through hands-on training. Also, producers that have never grown a particular crop or haven't grown a particular crop for some time can be helped tremendously through hands-on training in the field. That is where the county verification, or "multiplier fields" as we refer to them, can help. The county programs are a spinoff of the State Verification Programs where county Extension agent Andy Vangilder met with the producers on a weekly basis to assist them in production decisions

The County Rice Verification Program worked with two producers in the Rector area of Clay County in 2004. One individual was in his second year in the program and another hadn't produced rice in over ten years.

Dale Vangilder was in his second year of the program. The previous year the field experienced a sulfur deficiency which hurt yields. The field yielded 150 bushels of rice per acre. Dale applied sulfur this year, along with other management practices that were recommended. The field has been harvested but official yield has not been determined yet, but it is estimated at 175 to 180 bushels per acre.

Rick Smith had opened a farm parts store which he recently sold and went back into part-time farming. Andy Vangilder agreed to help him with his rice because things had changed since he last farmed. Water management and disease management were two things which Rick learned a lot about, as well as variety selection. Rick planted Francis rice and, according to FSA's estimate, in the grain bins plus what he sold, his field will pass 200 bushels per acre. He and Vangilder had discussed these yield goals, and he said later that he thought Andy was crazy. He was very pleased with knowledge gained and, of course, final yield.

County Rice Verification Program Successful

Learning to use the research data to produce the best yield is the purpose of having a verification field. Rice is a crop I knew very little about before this year. My producer, Clay Poole is a young farmer with his own fields after farming with his father for many years. This is the first time he has had a verification field. He followed Jeff Branson's advice and produced a good yield. He had corn on that particular field last year. He rotates his crops each year. The rice was so thick that it looked like you could walk on the top of it, yet he used less seed per acre than previously. Clay is interested in the results of our other studies in that field, including variety performance studies and seeding rate studies. His overall average on his rice was 176 bushels per acre. If reducing the amount of seed per acre and not reducing the overall yield proves effective, then all the rice producers could save money on their crop.

Extension Program Increases Rice Yield By 45 Bushels

Local rice producer Tony Wilkie came to the St. Francis County Extension Office with a concern for his rice yields. He historically averaged 125 bushels per acre for his farm. Wanting more from his rice crop, he asked the Extension Service for help. After a discussion of his rice farming practices, the decision was made to enlist him in a rice multiplier field to help get his farming practices in line with Extension recommendations. In this time of low commodity prices and high production costs, it is imperative that producers manage their crops in the most economically feasible manner by producing the highest possible yield with the least amount of inputs. It is the goal of the St. Francis County Extension Service to help producers increase their production efficiency by using all available technical and cultural practices. These practices use all of the latest Cooperative Extension Service research information on variety selection, rice fertility, weed control, insect control, and Integrated Pest Management to help streamline rice production in the county. The Rice Multiplier Field yielded 170 bushels of rice per acre. This is 45 bushels per acre above his 5-year average. With an average selling price this year of \$3.40 per bushel, the 45 bushel per acre increase in yield also increased the profit by \$153.00 per acre. Mr. Wilkie has now adopted more economical and research-based recommendations for his rice farm. By using Extension recommendations he has become a more successful and higher yielding farmer, and has a greater ability to sustain his farming operation in economically tough times.

General Program Information – The RRVP was implemented in 1983 to verify the recommendations of the University of Arkansas Cooperative Extension Service in commercial rice. The program is implemented by cooperating with producers in the county who are willing to allow Extension personnel to make management decisions based on conditions in the field. The producer agrees to carry out the recommendations, and the Extension personnel scout the field twice per week. A rice agronomist visits the fields weekly with the county agent and the producer to scout the field, educate the agents

and producers, and determine the best management options for the field. Management decisions are based on field conditions, Extension IPM recommendations, and input from researchers and Extension specialists.

Counties Involved – 11 Counties, including Arkansas, Ashley, Chicot, Clay, Craighead, Crittenden, Cross, Jackson, Poinsett, St. Francis and Woodruff.

Impact Numbers – Yields in the fields enrolled in the program ranged from -4 to 59 bushels per acre better than the state average of 154 bushels per acre, indicating that under recommended practices, the program can improve productivity. Most of these fields showed a positive net return, ranging from \$210 to \$388.

Contact Information – Branon Thiesse, 870-933-4565, bthiesse@uaex.edu; Chad Norton, County Extension Agent - Staff Chair, Lincoln County, (870)628-4247, cnorton@uaex.edu; Andy Vangilder, 870-598-2246, avangilder@uaex.edu; Fran Tomerlin, 870-265-8055, ftomerlin@uaex.edu; Kevin Norton, 870-261-1730, knorton@uaex.edu; Jeff Branson, 870-673-2661, jbranson@uaex.edu

Variety Trial Helps Increase Farmer's Quality of Life

Working with a cooperater on a rice variety trial helps to demonstrate the importance of variety selection in rice production. In 2003, about 48,100 acres of rice was grown in St Francis County. The St. Francis County average rice yield in 2003 was 143 bushels per acre. In this time of low commodity prices and high production costs, it is imperative that producers produce their crops in the most economically feasible manner by producing the highest possible yield with the least amount of inputs. It is the goal of the St. Francis County Extension Service to help producers to increase their production efficiency by using all available technical and cultural practices. These practices use all of the latest Cooperative Extension Service research information on variety selection, rice fertility, weed control, insect control, and Integrated Pest Management to help streamline rice production in the county. In an attempt to help rice producers in St. Francis County to increase profits through variety selection, a six variety, three replication variety trial was conducted on the Wright's farm in St. Francis County. With all varieties being grown in the same field under the same conditions with the same amount of inputs, there was a yield range from a low of 161 bushels per acre to a high of 179, a difference of 18 bushels per acre. Since the varieties were grown with the same amount of inputs, this increased yield relates directly to profits. At the time of harvest, average rice price per bushel was \$3.06, which would correlate to an increased return of \$55.08 per acre by selecting the highest yielding variety over the lowest yielding variety. This shows a direct increase to the farmer's profits, which will directly increase the farmer's quality of life.

Location – St. Francis County

Impact Numbers – All county rice producers now have a better understanding of the value of proper variety selection.

Contact Information – Justin Hensley, 870-261-1730, jhensley@uaex.edu

CES Section Contact Person – Charles E. Wilson, Jr., Professor/Extension Agronomist - Rice, 870-673-2661, cwilson@uaex.edu

Program Response: **Turf, Rangeland and Pasture Weed Management**

Contact: John Boyd, Weed Science Specialist, 501-671-2224, Pest Management

Situation

New, high quality seeded bermudagrass cultivars have been developed for turfgrass and forage use, but there is no methodology for early weed control methods for these grasses. Weed control in sprigged bermudagrass, which has been the standard for many years, is based on preemergence herbicides that are not an option in seeded types. In addition, it is not known how early in bermudagrass development that postemergence herbicides may be safely used to control weeds in seeded bermudagrasses. Lack of effective weed control is preventing many farmers from taking advantage of the new seeded varieties and the accompanying cost of establishment savings compared to sprigged bermudagrass.

Stakeholder Input

The Arkansas Cattlemen's Association, the Arkansas Forage and Grassland Council, the Arkansas Farm Bureau, Arkansas Turfgrass Association, Arkansas Golf Course Superintendents and hundreds of farmers and county agents have identified weed control in seeded bermudagrass as a major priority.

Overview

Experiments were conducted on the University Research Farm at Fayetteville and on a sod farm in Little Rock. Herbicides were applied at two weeks after bermudagrass emergence. "Riviera" bermudagrass was seeded at 1.0 pound PLS/1,000 square feet on July 1, 2003, at the University of Arkansas Research Station in Fayetteville, Arkansas. The site had been fumigated with methyl bromide. Herbicide treatments were applied at 2 weeks after emergence. Carrier volume was 50 gpa. Turfgrass cover was measured using digital image analysis. Herbicides applied to bermudagrass in a tank mix with MSMA at 2.0 lb/ai/a were flazasulfuron (0.046 lb/ai/a), foramsulfuron (0.026 lb/ai/a), trifloxysulfuron (0.026 lb/ai/a), clopyralid (0.38 lb/ai/a), triclopyr + clopyralid (0.28 + 0.094 lb/ai/a) and 2,4-D + dicamba + mecoprop (0.87 + 0.23 + 0.09 lb/ai/a), metribuzin

(0.38 lb ai/a) and metsulfuron (0.028 lb/ai/a). Quinclorac was applied alone at 0.5 and 0.75 lb/ai/a. At 7 DAT (days after treatment), percent bermudagrass groundcover for metribuzin + MSMA, triclopyr + clopyralid + MSMA and 2, 4-D + dicamba + mecoprop + MSMA was 24, 64 and 79%, respectively, compared to 95% for the untreated control. At 21 DAT, seedling bermudagrass cover was greater than 97% for all herbicide treatments except metribuzin + MSMA. Percent cover for the metribuzin + MSMA treatment was 89% compared to 99% for the untreated control.

A second “Riviera” bermudagrass trial was located on a non-fumigated site at a sod farm near Little Rock, Arkansas. It was seeded at 1.0 pound PLS/1,000 square feet on June 24, 2003. Herbicide treatments were applied at 2 weeks after emergence. Herbicide injury and weed control were rated on a 0 to 100 scale with 0 being no injury or weed control and 100 being dead turf or dead weeds. Carrier volume was 30 gpa. Metribuzin + MSMA produced 87% injury at 7 DAT. However, injury from this treatment dropped to 27% at 21 DAT. Injury from 2,4-D + dicamba + mecoprop + MSMA was 30% at 7 DAT, but declined to seven percent at 21 DAT. Weeds at the Little Rock site included large crabgrass (*Digitaria sanguinalis*), purslane (*Portulaca oleracea*), tighthead sprangletop (*Leptochloa fascicularis*), rice flatsedge (*Cyperus iria*), barnyardgrass (*Echinochloa crus-galli*), broadleaf signalgrass (*Urochloa platyphylla*), and tufted lovegrass (*Eragrostis pectinacea*). Treatments containing MSMA provided 95 to 100% control of all weeds except tufted lovegrass. Quinclorac alone at 0.5 and 0.75 lb/ai/a gave 100% control of barnyardgrass, 80% control of broadleaf signalgrass and 50% control of large crabgrass, but failed to provide control of sprangletop, purslane and rice flatsedge.

Extension Program Results and Accomplishments

Output Indicators

The data resulting from this research gives Arkansas bermudagrass forage farmers a method of quickly establishing a quality bermudagrass from seed at minimal cost and weed interference.

Outcome Indicators

The door was opened for the use of seeded bermudagrass, thus reducing establishment cost significantly.

Source of Funds

Federal Smith-Lever funds and grants from chemical companies.

Scope of Impact

Dissemination – This data was presented at and published in the abstracts of the Southern Weed Science Society Meeting. A PowerPoint presentation of this data was prepared for distribution to all counties and also made available on the Extension web site. These results were distributed to all of the states in the bermudagrass belt including North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Oklahoma, Texas, Louisiana, Tennessee, Kentucky and Virginia.

Scope of Program – Results have been incorporated into recommendations for pasture management and used by all counties in Arkansas.

<p>KEY THEME: ANIMAL HEALTH</p>

Program Response: **Poultry Disease Prevention**

Contact: Dr. F. Dustan Clark, Extension Poultry Veterinarian, Poultry Science, 479-575-4375, fdclark@uark.edu

Situation

Effective disease control education efforts require both disease prevention programs and disease diagnosis and treatment efforts. Disease outbreaks almost always involve economic losses due either to mortality or to impairments in production. In addition, diseases that are not treated can spread to other flocks, causing greater economic losses. Therefore, disease outbreaks must be quickly diagnosed and treated to prevent further losses. However, educational programs aimed only at disease diagnosis and treatment are, at best, short sighted. Thus, clientele must be taught the disease prevention principles to curb the causes of disease.

Stakeholder Input

Because of the economic consequences and suffering experienced by the animal, controlling disease has always been a priority among producers. Nevertheless, a brief survey of poultry production personnel and county Extension personnel confirmed the need for this program.

Overview

Effective disease control education efforts in Arkansas have been addressed through disease prevention programs as well as disease diagnosis and treatment efforts.

Educational efforts to prevent diseases included one-on-one consultations, presentations at local, regional, state and national meetings, regional disease prevention workshops, statewide in-service training for Cooperative Extension Service agents, fact sheets aimed at poultry producers and pet bird owners, newsletter articles and farm visits.

Extension Program Results and Accomplishments

Output Indicators

- 39 Presentations at local, regional, and state meetings.
- 127 Farm visits.
- 23 Fact sheets, newsletter articles and popular press articles.
- 105 Training sessions and one-on-one consultations.
- 6 Newspaper, radio and television interviews.

Outcome Indicators

- 0 Outbreaks of major poultry diseases in Arkansas.
- 658 Industry leaders who received factual information about disease prevention.
- 268 Individuals who received disease prevention information.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – This program is available to all poultry producers in the state.

Scope of Program – The program was presented in Arkansas, Virginia, Texas, Missouri and Oklahoma.

<p>KEY THEME: ANIMAL PRODUCTION EFFICIENCY</p>
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Program Response:

Arkansas Beef Improvement Program

Contact: Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu, and John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu

Situation

Approximately 26,000 farms in Arkansas produce beef cattle. Arkansas is the home of 1.9 million head of cows and calves, with the number of beef cows and heifers reaching over 1.0 million head in 2004. The average herd size is 30 head, with 80% of the farms having less than 50 head. The gross income from Arkansas' beef cattle industry reached \$409 million with a total economic impact over \$2 billion annually.

Stakeholder Input

Beef production makes up a major part of Arkansas livestock agriculture. Production of these grazing animals is dependent on forages. Hay production is also significant, and many producers sell hay as a cash crop. County agents work with a wide range of clientele who are stakeholders in forage production. Stakeholders include, but are not limited to, producers, youth, county agents, agricultural advisors and agribusiness representatives. Stakeholders provide input regarding the need for educational programs through several means including planning meetings, surveys, informal discussions and electronic methods. Educational programs are developed to reach stakeholders in various ways including, but not limited to, formal educational meetings, field meetings, demonstrations, newsletters and development of educational materials distributed through traditional as well as electronic means.

Overview

The goal of the Arkansas Beef Improvement Program (ABIP) is to demonstrate cost-effective management practices. The program focused on the beef cattle enterprise using an integrated resource management team approach to solving problems. Problems related to animal health, nutrition, genetics, forage production, reproduction and record keeping were addressed. An ABIP team of Extension specialists, the local county Extension agent and the producer reviewed production practices, which led to the development of a farm plan of work.

The ABIP implemented special projects to educate and provide technical assistance to producers who need help in a particular production area. Project areas included controlled breeding seasons, cowherd performance, feedlot preconditioning, hay production and management, pasture improvement and replacement heifer development.

The workshop lasted two nights for two and a half hours each night. The workshop covered enterprise budgets, supplemental feeding, mineral supplementation, forage production planning, cow herd performance testing, and management calendars. Attendance ranged from 25 to 30 participants per workshop.

ABIP field days and activities were conducted across the state on ABIP farms to demonstrate how implementing cost-effective management practices helped participating producers reach their goals.

The ABIP published newsletters and a monthly article featured in *Arkansas Cattle Business* (a publication of the Arkansas Cattlemen's Association) to relay knowledge gained from ABIP farms to producers, county Extension faculty and specialists. Information gained through the program was also used in developing Extension fact sheets, slide sets and miscellaneous publications. During the past nine years, many beef cattle producers contacted their county Extension agents to help them develop an ABIP approach to their cattle operations. The ABIP demonstrations continuously work to enhance the credibility and image of the Cooperative Extension Service.

Extension Program Results and Accomplishments

Output Indicators

- 4 Farms enrolled in five-year ABIP whole farm program.
- 21 Farms enrolled in ABIP special projects.
- 5 County-level ABIP workshops conducted.
- 125 Number of producers attending ABIP workshops.

- 4 ABIP newsletters.
- 12 ABIP news releases.
- 200 Number of producers attending ABIP field days, county or regional programs.
- 10,000 Number of producers reading the ABIP articles in *Arkansas Cattle Business*.

Outcome Indicators

- The average number of cows increased 38% (68 to 91 head) on the ABIP whole farms.
- Herd break-even per pound of beef sold decreased 28% from \$0.52 to \$0.37 per pound from year one to year five of the program.
- Beef sold per animal unit during year one of the program was 436 pounds and increased by 24% to 539 pounds by year five.
- Specified cost per animal unit decreased 23% from year one (\$226) to year five (\$174).
- The average mature cow calf crop percentage in year one was 85% and improved to 93% by year five.
- The average supplemental feed cost per animal unit in year one averaged \$48 and by year five it was reduced to \$24.
- In one case, soil potassium levels were very low, and bermudagrass stands were declining. The forage specialist recommended a fertilization rate to improve soil potassium, and by year five, the percent stand of bermudagrass improved from 83% to 93% and the percent bare ground declined to zero percent.
- One cooperator's cow herd started with a 205-day adjusted weaning weight of 445 pounds. By year five, the average 205-day adjusted weaning weight improved to 501 pounds.

Source of Funds

Arkansas Beef Improvement Grant (USDA-CSREES)

Scope of Impact

Dissemination – Program activities were available statewide as well as regionally through *Arkansas Cattle Business*, ABIP newsletters and UAEX web site.

Scope of Program –

- 1) State Specific. 24 counties: Baxter, Calhoun, Cleveland, Craighead, Dallas, Faulkner, Franklin, Fulton, Howard, Izard, Lonoke, Madison, Marion, Montgomery, Nevada, Perry, Polk, Pope, Pulaski, Saline, Union, Van Buren, White, Yell.
- 2) Multi-State. AL, KY, LA, MO, MS, OK, TN, TX.

Programs of Excellence**ABIP Whole Farm Demonstrations**

General Program Information – Beef cattle production is a very important part of the economy of White County. The Arkansas Beef Improvement Program (ABIP) helps producers become more efficient, thus more profitable. The ABIP whole farm program covers every aspect of the farm to make it more efficient. It is a five-year commitment for the producer and Extension personnel. The first part of the program is to establish benchmark data. From this data, management plans are set into place to help the producer reach their goals.

Number and Names of Counties Involved – 4: Madison, Nevada, White and Yell

Impact Numbers – Even though this producer just completed the first year of the ABIP whole farm program, changes in the area of mineral nutrition, sire selection and forage management have made a difference.

CES Section Contact Person – Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu, and John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu

ABIP Breeding and Calving Season Project

General Program Information – To demonstrate and document the beef cattle management changes and the impact of those changes when adjusting from a yearlong breeding program to a short (90 days) breeding season.

Number and Names of Counties Involved – 5: Dallas, Howard, Montgomery, Perry and Union

Impact Numbers – The average number of years it took to reach the cooperator's desired breeding and calving season goals was 4.6 years.

The percentage of cows calving in the desired calving season increased from year one (40%) to the final year of the project (100%).

The average length of the calving season decreased from 282 days to 97 days.

When averaged across all farms, break-even cost decreased from 282 days to 97 days.

Specified cost per animal unit dropped from \$180 to \$122.

Income over specified cost per animal unit improved 75% from \$78 to \$135.

CES Section Contact Person – Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; Dr. Brett Barham, Animal Science Section, 501-671-2162, bbarham@uaex.edu; and John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu

ABIP Replacement Heifer Project

General Program Information – This project’s goal is to demonstrate the management necessary to develop heifers from weaning to first breeding. The rising cost of replacement heifers is one of the most expensive and probably one of the most important aspects of a cow-calf herd. Replacement heifers are the future of the cow herd. Therefore, proper heifer management is critical in order to ensure success in the heifer’s first breeding season. Management decisions during this development phase of replacement heifers can help ensure a productive cow.

Number and Names of Counties Involved – 3: Baxter, Marion and Polk

Impact Numbers – The number of heifers exhibiting estrous cycles prior to the breeding season improved from 60% in year one to 82% in year two.

The feed cost per pound of gain for year one and two was \$0.48 and \$0.32, respectively.

The total cost per pound of gain for year one and two was \$0.69 and \$0.50, respectively.

The total cost of raising heifers to breeding (including the value of the heifer) ranged from \$732 to \$782 per head.

CES Section Contact Person – Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; Dr. Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu; Dr. Brett Barham, Animal Science Section, 501-671-2162; and John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu

ABIP Forage Testing and Supplemental Feeding

General Program Information – The project’s purpose is to demonstrate the value of determining the supplemental feeding program based on a forage test.

Number and Names of Counties Involved – 1: Newton

Impact Numbers – By adjusting the supplemental feeding program, the producer was able to maintain a beef cow for less than \$40 over the winter period. This was a saving of over 50% from his previous supplemental feeding program.

CES Section Contact Person – Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; Dr. Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu; and John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu

Program Response: Beef Cattle Management

Contact: Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; Dr. Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu; Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu; Dr. Brett Barham, Animal Science Section, 501-671-2162, bbarham@uaex.edu; John Richeson, Animal Science Section, 501-671-2180, jricheson@uaex.edu; Dr. Jeremy Powell, Animal Science Section, 479-575-5136, jerpow@uark.edu; and Doug Kratz, Animal Science Section, 501-671-2179, dkratz@uaex.edu

Situation

Approximately 26,000 farms in Arkansas produce beef cattle. Arkansas is the home of 1.9 million head of cows and calves with the number of beef cows and heifers reaching over 1.0 million head in 2004. The average herd size is 30 head, with 80% of the farms having less than 50 head. The gross income from Arkansas' beef cattle industry reached \$409 million with a total economic impact over \$2 billion annually.

Stakeholder Input

Beef, dairy and horse production make up a major part of Arkansas agriculture. Production of these grazing animals is dependent on forages. Hay production is also significant, and many producers sell hay as a cash crop. County agents work with a wide range of clientele who are stakeholders in forage production. Stakeholders include, but are not limited to, producers, youth, county agents, agricultural advisors and agribusiness representatives. Stakeholders provide input regarding the need for educational programs through several means including planning meetings, surveys, informal discussions and electronic methods. Educational programs are developed to reach stakeholders in various ways including, but not limited to, formal educational meetings, field meetings, demonstrations, newsletters and development of educational materials distributed through traditional as well as electronic means.

Overview

The programs that address beef cattle management education include Arkansas Beef Quality Assurance Program, Arkansas Steer Feedout Program, Reducing Winter Feed Cost Focus Program and Arkansas Cattle Growers' Conference.

The overall goal of the Arkansas Beef Quality Assurance Program (BQA) is to encourage the consistent production of high quality cattle in Arkansas, enhancing the reputation of Arkansas cattle and assuring their health and wholesomeness. Educational efforts center on cow-calf management practices that affect the overall value and quality of the cattle product (both cows and calves). In 2004, the Arkansas BQA program began certifying producers. The producers had to successfully take a 50-question exam and pledge to follow BQA guidelines.

The Arkansas Steer Feedout Program provides cow-calf producers with information about the post weaning performance and carcass characteristics of their calves. It creates an opportunity for producers to determine how their calf crop fits the needs of the beef industry and provides the information needed to determine if changes in genetics and/or management factors are warranted to compete in beef production.

Calves were placed on feed at Oklahoma Feeders, Inc. in Coyle, Oklahoma. Performance data generated from the feedlot included average daily gain, feed efficiency, cost of gain, break-even cost and net return. Carcass data included dressing percentage, carcass weight, ribeye area, back fat thickness, percentage of kidney-pelvic-heart fat, and USDA yield and quality grade.

The Arkansas Beef Improvement Program identified that four of the top five cost items related to calf production are associated with the cost of feeding the cow herd. That cost makes up nearly half of the total expenses of production. The Reducing Winter Feed Cost Focus Program was developed to address these concerns and was continued in 2004. The objective of the program is to demonstrate cost-effective beef cattle and forage management practices to reduce winter feed cost. This program focuses on stockpiled forages, forage testing and determining supplemental feeding needs, planting winter annuals and rotational grazing. Production and economic data were collected to document production practice success.

Two Cattle Growers' Conferences were conducted in 2004 (Boone and Clark Counties). Producers, Extension and allied industry personnel planned these day-long programs. Speakers from all over the south-central United States presented the latest information available for stocker cattle management and retained ownership. The list of topics is a mixture of pasture management, cattle health, nutrition, marketing and food safety issues.

Extension Program Results and Accomplishments

Output Indicators

1,678	Number of clientele enrolled in the Beef Quality Assurance Program.
101	Number of clientele who are Beef Quality Assurance Certified.
85	Number of calves enrolled in Arkansas Steer Feedout Program.
12	Number of producers who enrolled steers in the Arkansas Steer Feedout Program.
300	Number of producers attending the Arkansas Cattle Growers' Conference.
138,842	Number of producers attending educational programs or who were contacted by Extension.
2,027	Number of producers attending educational meetings, demonstrations, farm visits and/or field days or who were contacted by Extension to educate clientele on beef cattle nutrition.
8,543	Number of producers attending educational meetings, demonstrations, farm visits and/or field days or who were contacted by Extension to educate clientele on beef cattle management and forage production.
12,337	Number of producers attending educational meetings, demonstrations, farm visits and/or field days or who were contacted by Extension to educate clientele on reducing winter feed cost.

Outcome Indicators

\$27.26	Average dollar loss per calf due to misused cow-calf management practices.
\$1.3 million	Possible savings to the Arkansas beef cattle industry because of producers enrolled in the Arkansas Beef Quality Assurance Program.
\$20 and \$30	Average dollar amount per head winter feed cost was reduced due to stockpiling fescue and bermudagrass forages, respectively.
\$35	Average dollar amount per head winter feed cost due to planting winter annuals.
99	The average number of days grazing for rotational grazing compared to 40 days of continuous grazing.
43 and 56	The average number of days cattle grazed stockpiled fescue and bermudagrass forages, respectively.

- 60 Producers that adopted management practices to reduce winter feed costs.
- 1,610 Number of producers that changed beef cattle and forage management practices to improve efficiency.
- Steers enrolled in the Arkansas Steer Feedout Program graded 54% Choice, had an average daily gain of 2.89 pounds per head per day and had a feed cost of gain of \$0.54 per pound. The beef cattle industry standards are grade Choice, yield grade 3.5 or better and hot carcass weight between 550 and 950 pounds. Fifty-seven percent of the steers fit the combined standards. Steers that met the industry standards had higher average daily gain (3.00 vs. 2.80 pounds) and averaged \$95 per head more than those not fitting the industry standards.

Source of Funds

Smith-Lever and Arkansas Beef Improvement Grant (USDA-CSREES).

Scope of Impact

Dissemination – Program activities were available statewide as well as regionally through Arkansas Cattle Business, ABIP newsletters and UAEX web site.

Scope of Program –

- 1) State Specific. 44 counties: Baxter, Benton, Boone, Calhoun, Carroll, Clark, Cleburne, Cleveland, Crawford, Dallas, Faulkner, Franklin, Fulton, Garland, Greene, Hempstead, Hot Spring, Howard, Independence, IZard, Johnson, Lincoln, Little River, Logan, Lonoke, Madison, Marion, Miller, Nevada, Perry, Polk, Pope, Pulaski, Saline, Searcy, Sebastian, Sevier, Sharp, Stone, Union, Van Buren, Washington, White and Yell.
- 2) Multi-State: AL, KY, LA, MO, MS, OK, TN, TX.

Programs of Excellence

Utilizing Stockpiled Fescue to Reduce Winter Feed Cost

Success Story – Two Baxter County producers participated in the stockpiled forage demonstration. The producers followed Extension’s recommendation on how to manage stockpiled fescue. One producer grazed an extra 83 days on stockpiled fescue and saved \$42.74 per head in supplemental feeding cost.

The second producer stockpiled fescue and was able to graze an extra 48 days with a savings of \$8.76 per head.

Number and Names of Counties Involved – 14: Baxter, Carroll, Cleburne, Drew, Franklin, Hot Spring, Madison, Perry, Pope, Pulaski, Searcy, Union, Van Buren and White

Impact Numbers – Producer saved \$42.74 per animal unit in winter feed cost.

Producer saved \$8.76 per animal unit in winter feed cost.

CES Section Contact Person – Mark Keaton, County Extension Agent - Agriculture, 870-425-2335, mkeaton@uaex.edu.

Forage Testing and Supplemental Feeding Demonstration

Success Story – Dan Wilson of Stamps, Arkansas, reduced his winter feed costs by \$28.75 per head due to forage testing. He had been over feeding protein in past year. The forage analysis revealed that his hay was 12% crude protein and that extra protein supplementation was not needed.

Most producers depend on ranch-raised forages, both hay and pasture to provide the bulk of the nutritional requirement of their cattle herd. In many situations, the forages are of inadequate quality to meet the needs of the cattle. Many producers develop nutritional supplements plans based on estimates and guesses. Basing supplements on forage analysis can save producers money or prevent reduced production which impacts income. Cost savings were estimated based on current costs of last year's feeding program and the actual cost of this year's program. For producers participating in this demonstration, cost savings ranged from \$9.00 to \$54 per head.

Number and Names of Counties Involved – 8: Baxter, Hot Spring, Lafayette, Little River, Pike and Searcy

Impact Numbers – Producers saved \$9.00 to \$54 per head per animal unit in winter feed cost.

CES Section Contact Person – Joe Vestal, County Extension Agent - Agriculture, 870-921-4744, jvestal@uaex.edu, and Mike McCarter, County Extension Agent - Agriculture, 870-285-2161, mmccarter@uaex.edu

Winter Annual Demonstration

Success Story – Feed cost is the major expense in beef cattle production. Extension conducted a number of educational programs to increase the awareness of overseeding pastures with winter annuals. As a result, a number of producers either purchased or rented no-till drills. This group of producers is located on the Crowley's Ridge in Greene County. This is the location of 99% of the forage production in the county. As a result of overseeding pastures with winter annuals, winter feed costs were reduced an average of 30%. This is a major saving to these operations.

Number and Names of Counties Involved – 4: Greene, Hempstead, Perry and Pope

Impact Numbers – Winter feed costs were reduced an average of 30%.

CES Section Contact Person – Allen Davis, County Extension Agent - Agriculture, 870-236-6921, ardavis@uaex.edu

On-Farm Bull Test

Success Story – On-farm bull tests were conducted on a number of Greene County's registered beef operations. This has been a great tool for those purebred producers to provide additional information to buyers about their cattle. This program is conducted on the producer's farms. Bulls were weighed monthly after the initial weighing. At the completion of the test, scrotal measurements are taken, along with hip heights, and a complete physical exam is administered. As a result of this program, these bulls are being sold for at least \$500 more per head due to the additional performance data. In addition, overall demand from commercial cattlemen has increased.

Number and Names of Counties Involved – 1: Greene County

CES Section Contact Person – Allen Davis, County Extension Agent - Agriculture, 870-236-6921, ardavis@uaex.edu

Choosing the Correct Cattle Feed Supplement

Success Story – Marion County livestock producers wanted to gain knowledge on developing cost-effective winter feeding programs for their cattle operations. Twenty-five beef cattle producers participated in a multi-educational program conducted by the Extension Service. An educational seminar was conducted that taught how to utilize a

computer program and hay test results to develop the most cost-effective supplemental feeding program.

Some producers learned that they were overfeeding protein to their cattle and were actually needing an energy feed in order to properly supplement the hay. All cattle producers improved their cattle performance, resulting in an average of \$3,500 of increased profit per producer. Fifteen producers have changed from feeding unnecessary protein feeds to energy feeds. Four producers have switched to less expensive bulk feeds versus buying feed in a sack, which is more expensive.

Number and Names of Counties Involved – 1: Marion County

CES Section Contact Person – Terry Davis, Marion County Extension Agent, 870-449-6349, tdavis@uaex.edu

Program Response:

Dairy Cattle Management

Contact: Dr. Jodie Pennington, Animal Science Section, 501-671-2190, jpennington@uaex.edu

Situation

The total economic impact of the dairy industry with heifers and dairy products is \$450 million annually. Approximately 240 dairies with 27,000 dairy cows are located in Arkansas. The number of dairy herds continues to decrease. With an average milk production per cow of 12,281 pounds in commercial herds, the Arkansas dairy industry produces about 400 million pounds of milk per year. Milk income is \$60 to \$70 million per year. Fluctuation in milk prices, quality milk production and efficiency of milk production continue to be major concerns of Arkansas' dairy industry.

Stakeholder Input

The Cooperative Extension Service worked with many dairy-related businesses and government agencies, including Arkansas Farm Bureau, feed companies and milk marketing cooperatives to identify and assist with their educational needs. E-mail was used more effectively to communicate with the industry, including producers, through a list serve for the Arkansas dairy industry. Extension continues to provide educational opportunities through Heart of America DHI and in conjunction with neighboring states.

Overview

Extension educational programs helped dairy producers and the related industries identify areas to enhance production efficiency and compete in an increasingly competitive national milk market. The number of dairy herds in Arkansas decreased, but herds increased in size. Overall, the dairy industry in the state closely reflected trends in dairying throughout the U.S. and all of full-time agriculture.

A major concern of the dairy industry is the fluctuation in milk prices and the present depressed prices. Many factors affect profitability in the industry, but higher milk production per cow is associated with greater profits per cow. Arkansas dairies need to increase their production per cow to be competitive with western states that lead the U.S. in milk production per cow and trends for increasing total milk production.

Demonstrations were conducted to show producers how to improve milk quality in hopes they might receive a financial quality premium. Udder singeing appears to improve cleanliness of the udders and decreases preparation time for milking. In addition, the use of fly ash and practices to improve cow comfort improve the health of the cow.

As financial incentives develop for milk producers in early fall and winter months, demonstrations have been conducted to show that heat detection aids and estrus synchronization can improve fertility and tighten the calving season.

A dead animal composting demonstration was conducted in Washington County with Biological and Agricultural Engineering to illustrate the disposal of dead dairy animals. It is now approved as a method of large animal disposal by the Arkansas Livestock and Poultry Commission. With the new regulations prohibiting the slaughter of non-ambulatory animals following the detection of a cow with BSE in the U.S., this method of disposal will be of much significance as there are no rendering plants in Arkansas.

State regulations require that dairies have a waste management permit or a management plan to control waste runoff. Recently, most dairy meetings have contained results from the nutrient management demonstration that illustrated the economic net value of manure as fertilizer at about \$50 per cow. A cooperative effort through Biological and Agricultural Engineering with the Natural Resources Conservation Service (NRCS) and other government agencies has resulted in most of the dairy farms in Arkansas initiating plans to construct improved waste management facilities to comply with animal liquid waste regulations. A model heavy use area utilizing fly ash as the surface material to provide additional support for the cows looks satisfactory, and a field day was conducted in the fall of 2003. Although most dairy producers received cost-share to assist with regulatory compliance, the regulations are considered burdensome and are used as an excuse to exit the industry.

The Dairy Herd Improvement Association (DHIA) record-keeping and production testing program remains the primary demonstration and premier production testing program in the U.S. Dairy herds enrolled in DHIA increased milk production and profits.

DairyMetrics, a new benchmarking tool from DHIA, allowed various genetic, reproductive, feeding and health parameters to be related to income-over-feed costs, thus allowing the documentation of the results of following recommended management policies.

Multi-disciplinary demonstrations involved heat stress in the holding pen and feeding area and fly control on the dairy utilizing parasitoids. Parasitoids have offered a method of fly control that appears to be beneficial, especially on clean dairies, and with the opportunity to decrease the likelihood of pesticides in the milk supply.

Dairying remains an economically important enterprise in Arkansas as it has a total economic impact of about \$450 million. The direction of the dairy Extension program includes continuing programs for dairy producers that allow them to provide as much milk as efficiently as possible for processors and working with other states on tours and demonstrations to exhibit new technology. As Arkansas produces less than one-half of the milk products that are consumed in the state, dairy farming has potential for expansion and increased economic impact in the state. The dairy industry affords one of the few opportunities for numerous independent agricultural producers to obtain a sound return on their investment in the Ozarks and close-by rolling hills. Coleman-Turner Dairy is constructing a new facility with potential to process more milk in spite of decreased milk production in the state.

Extension Program Results and Accomplishments

Output Indicators

16,466	Number of producer-contacts attending educational programs (including Extension-related industry meetings), field days, etc., and receiving educational materials.
41	Number of educational meetings.
24	Number of demonstrations and/or field days held to educate clientele.
12	Number of educational newsletters produced.
72	Number of herds involved in DHIA program, 26%, is highest percentage recorded.
22	Number of youth or open dairy shows for dairy and goats conducted at the Arkansas State Fair and Livestock Show.
1,200	Number of fourth grade students participating in the Domino's Pizza Ranch educational activity.

Outcome Indicators

- In 2003, the average milk production per cow for DHIA herds was 16,536 pounds compared

to the state average of 13,008 pounds.

- The greater milk production from DHIA herds amounted to increased income of about \$600 per cow or \$60,000 per herd and over \$4 million per year in Arkansas.
- A survey of producers at the Ark-Tenn field day in 2003 indicated that 62% of producers had fans and sprinklers in their holding pens, up from almost none a few years ago.

Source of Funds

Smith-Lever, 319 Projects, Southern Region SARE Projects, cooperative efforts with Ark-Tenn Dairy Economic Development of Arkansas Fund Commission.

Scope of Impact

Dissemination – Program activities were available county and statewide as well as regionally through dairy newsletters and UAEX web site.

Scope of Program – State Specific. 26 Counties: Baxter, Benton, Boone, Carroll, Columbia, Conway, Faulkner, Franklin, Fulton, Grant, Greene, Izard, Logan, Madison, Marion, Pike, Pope, Pulaski, Saline, Scott, Searcy, Stone, Van Buren, Washington, White and Yell

Programs of Excellence

Dairy Herd Improvement Program

Success Story – The Dairy Herd Improvement Association (DHIA) record-keeping and production testing program remains the primary demonstration and premier production testing program in the U.S. Herds in Arkansas are tested through the Heart of America DHIA and processed through Dairy Records Management Systems. Dairy herds enrolled in DHIA increased milk production and profits. In 2003, the average milk production per cow for DHIA herds was 16,536 pounds compared to the state average of 13,008 pounds. The greater milk production from DHIA herds amounted to increased income of about \$600 per cow or \$60,000 per herd and over \$4 million per year in Arkansas. DairyMetrics, a new benchmarking tool from DHIA, allowed various genetic, reproductive, feeding and health parameters to be related to income-over-feed costs, thus allowing the documentation of the results of following recommended management policies.

General Program Information – Herds in Arkansas are tested through the Heart of America DHIA and processed through Dairy Records Management Systems.

Number and Names of Counties Involved – 15: Benton, Boone, Carroll, Columbia, Conway, Faulkner, Franklin, Logan, Madison, Marion, Pope, Van Buren, Washington, White and Yell.

Impact Numbers – In 2003, the average milk production per cow for 72 DHIA herds was 16,536 pounds compared to the state average of 13,008 pounds. The greater milk production from DHIA herds amounted to increased income of about \$600 per cow or \$60,000 per herd and over \$4 million per year in Arkansas.

CES Section Contact Person – Dr. Jodie Pennington, Extension Dairy Specialist, 501-671-2190, jpennington@uaex.edu

Program Response:

Forage Production and Management

Contact: Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu

Situation

Arkansas' climate and most of its soil and terrain are suited for the production of grasses and legumes necessary to support the livestock industries. Two 2 million acres of bermudagrass, fescue and mixed grasses (total 6 million acres) are managed to enhance livestock production and land stewardship.

Stakeholder Input

Beef, dairy and horse production make up a major part of Arkansas agriculture. Production of these grazing animals is dependent on forages. Hay production is also significant, and many producers sell hay as a cash crop. County agents work with a wide range of clientele who are stakeholders in forage production. Stakeholders include, but are not limited to, producers, youth, county agents, agricultural advisors and agribusiness representatives. Stakeholders provide input regarding the need for educational programs through several means including planning meetings, surveys, informal discussions and electronic methods. Educational programs are developed to reach stakeholders in various ways including, but not limited to, formal educational meetings, field meetings, demonstrations, newsletters and development of educational materials distributed through traditional as well as electronic means.

Overview

A forage database containing forage samples and poultry litter samples that were analyzed from 1985 to 2004 by the University of Arkansas Agricultural Services Laboratory is being used throughout the state at cattle field days and other cattle producer meetings and conferences. Information on nutrient composition of forages in this database can be sorted in a variety of ways: by type (hay, pasture, silage); species; poultry litter; county or statewide; laboratory ID number; analysis date; and the number and percentage of samples in the database that have composition values above a specified

level for a single nutrient or a combination of nutrients. The database has been used to generate average forage nutrient values by county and statewide. The forage database will continue to be updated as forage analysis results are received from the laboratory.

The Arkansas Grazing Management School (AGMS) program was designed to teach management options to improve efficiency of forage utilization. The school's primary premise is to teach producers to match forage, soil, livestock and water resources with goals, abilities and resources. Schools conducted in 2004 emphasized a seasonal approach to planning and managing forage to reduce winter feed costs and to gain more grazing days per year.

The Arkansas Forage and Grassland Council (AFGC) was organized 31 years ago as a cooperative effort between the University of Arkansas Extension Service, agricultural agency groups and agribusiness groups to promote Arkansas forage research and educational programs. Educational programs are conducted annually.

Alfalfa acreage in Arkansas has declined from a high of over 112,000 acres to around 10,000 acres currently, which is the lowest on record for the state. Recent producer interest has shown a need for an educational program on alfalfa management.

The acceptance of alfalfa will depend on ease of establishment and the low risk of forage production loss. New establishment techniques are being investigated to learn if alfalfa can be grown in living bermudagrass sod. The purpose of this project is to determine if forage quality can be improved in a low-risk and low-cost manner. As the alfalfa stands thin over time, the companion bermudagrass will spread to fill the stand. Thus, there is little risk of losing forage production due to premature stand loss of alfalfa. Treatments are being studied to improve establishment include planting date, seeding rate, bermudagrass residue management and insect control.

Winter feed costs are a major expense for beef cattle production. Extension Animal Science faculty developed a demonstration program in 2002 that emphasized four practices that can help producers reduce these costs. Reducing Winter Feed Costs is a statewide effort developed as an Extension Focus Program. It includes four focus areas: stockpiled forages, winter annual forages, supplemental feeding based on hay quality and rotational or strip grazing. An in-service training was conducted for county agents in February 2002 to allow them to select demonstration farms. Demonstrations began in fall 2002. Production and financial data are being collected. This information will allow other producers across the state to see how effective these practices are in reducing winter feed costs. Producers using stockpiled forages have significantly reduced winter hay feeding days and cost per animal unit.

Rotational grazing improves forage utilization. The practice of strip-grazing employs portable electric fence to limit cattle access to only enough pasture for two to three days at time. Strip-grazing has more than doubled utilization of stockpiled forages.

Balancing rations for livestock based on quality of hay being fed can reduce costs and improve animal performance. Producers that developed feeding programs based on the quality of their hay saved money. Producers with good quality hay that did not require supplementation reduced their average feed cost, whereas producers whose hay quality was low and needed supplementation had a higher average feed cost. Producers having good quality hay saved more per head than producers feeding low quality hay and supplement.

Forage and grassland management education for youth is being addressed through the Grassland Evaluation Contest. This program emphasizes proper grassland management for both livestock and wildlife production. Students compete by assessing the condition of a selected pasture area, its suitability for wildlife habitat, the soil at the site, forage production and livestock needs and plant identification. In-service training was conducted in 2002 and 2003 for county agents interested in training youth for this program. Agents have found that the information has also been very useful for working with producers due to its applied format. Arkansas 4-H teams have competed at the state and national level for the past three years. The top five teams earned the right to compete at the Mid-America Grassland Evaluation Contest. Arkansas 4-H teams have placed in the top group each year of the competition.

Extension Program Results and Accomplishments

Output Indicators

7,836	Number of educational meetings, demonstration farm visits and/or field days held to educate clientele on forage production and grazing management.
1,068	Number of educational meetings, demonstration farm visits and/or field days held to educate clientele on beef cattle nutrition.
59	Number of grazing schools conducted during 1996-2004.
2,750	Number of participants in Grazing Schools from 1996-2004.
45	Number of Reducing Winter Feed Cost farm demonstrations conducted in 2003-2004.
56	Number of Reducing Winter Feed Cost farm demonstrations underway for 2004-2005.
18	Number of producers using strip-grazing for their stockpiled forages.
9	Number of youth teams that competed in the 2004 State Grassland Evaluation Contest.

38 Number of youth participants in the State Grassland Evaluation Contest.

Outcome Indicators

- 557 Number of participants who changed their forage and grazing management production practices.
- 198 Number of participants who changed their beef nutrition management practices.
- In the winter of 2003-2004, 14 producers saved an average of \$18.59 and \$24.15 per head when grazing stockpiled fescue and stockpiled bermudagrass, respectively, in winter instead of feeding hay and supplement.
 - Sixteen producers used strip-grazing for their stockpiled forages thus gaining an additional 53 and 10 animal-unit grazing days on stockpiled fescue and stockpiled bermudagrass, respectively, than those that allowed cattle unlimited access to the stockpiled pasture. This increase was worth an average of \$859 and \$204 per farm for the fescue and bermudagrass farms, respectively.
 - In 2003-2004, the average cost per head was \$0.84 for producers that developed feeding programs based on the quality of their hay.

Source of Funds

Smith-Lever and Arkansas Grazing Lands Advisory Committee funds.

Scope of Impact

Dissemination – Program activities were available at county level and statewide as well as regionally through UAEX web site.

Scope of Program – State Specific. 45 Counties: Baxter, Benton, Boone, Calhoun, Carroll, Clark, Conway, Crawford, Dallas, Faulkner, Franklin, Fulton, Garland, Grant, Hempstead, Hot Spring, Howard, Independence, Izard, Johnson, Lincoln, Little River, Logan, Lonoke, Madison, Miller, Nevada, Newton, Perry, Polk, Pope, Pulaski, Saline, Scott, Searcy, Sebastian, Sevier, Sharp, St. Francis, Stone, Union, Van Buren, Washington, White and Yell.

Programs of Excellence

Feed Them Right or Pay the Price Later

Success Story – Low phosphorus and potassium levels in the soil have resulted in underutilization of forages in rotationally grazed forages. By following soil test recommendations, producers can see the benefits with increased calf gains. Feed Them

Right or Pay the Price Later was implemented on eight beef farms in Sharp County. All soil samples showed phosphorus and potassium in the low range (20-60 pounds and 160-200 pounds per acre, respectively). These low levels adversely affect how much forage can be produced for a rotational grazing program to be effective.

By following the soil test recommendations, milk production and calf gains increased by approximately 32 pounds per calf. Two hundred and twenty-five cows were rotationally grazed on these eight farms. Individual producer records showed 7,200 extra pounds of beef produced due to the improved soil fertility. This extra weight gain amounted to \$32 more per head at market time. By feeding cattle right through by managing soil fertility, producers did not have to pay later.

Number and Names of Counties Involved – 1: Sharp County

CES Section Contact Person – Joe Moore, County Extension Agent - Agriculture, 870-994-7363, jjmoore@uaex.edu

What Is the Quality of Your Hay?

Success Story – Local cattle producers are faced with rising diesel, equipment, and land cost. They have to be as efficient as possible to deal with these high prices. The hay show at the county fair is a good place to provide a better understanding of hay production and management.

Hays submitted to the county hay show were analyzed for their nutrient content. Before the results are announced, the producers are asked to pick, based on visual appraisals, the best and worst hays.

Most oftentimes than not, the point is made that it is impossible to pick the best and worst hay based on visual estimates. Following the results of the forage analyses, producers realize that the best way to determine the quality of the hay is to forage test.

Number and Names of Counties Involved – 2: Franklin and Logan

CES Section Contact Person – Steven Sheets, Logan County Extension Agent - Agriculture, 479-963-2360, ssheets@uaex.edu, and Cindy Ham, Franklin County Extension Agent - Agriculture, 479-965-2272, cham@uaex.edu

The Right Variety Makes a Ton of Difference

Success Story – Cattle producers also produce and sell hay. With a very limited amount of land, the hay producers need to produce as much hay as possible. Bermudagrass Variety Trials show producers which variety yields more within their county or area. In the St. Francis County Bermudagrass Variety Trials, there was a 2.7 ton per acre

difference in the highest producing bermudagrass compared to the lowest producing bermudagrass. With an average selling price of \$55 per ton, the top-yielding variety improved profit margins by \$149.60 per acre.

Back in 1997, a few producers had consistently “maxed out” their sales of high quality bermudagrass hay. Unable to satisfy the demand, they realized the growing need to encourage other producers to become involved in the production of high quality bermudagrass hay. In addition, producers wanted to document the quality of the hay being produced in order to support clientele requests. The Benton County “Quality Forage” program began in 1998. Outreach educational efforts have allowed educational information to be expanded into several Arkansas counties as well as neighboring states (Missouri, Oklahoma and Kansas).

Currently, over 100 Benton County producers remain involved with the program. Data from 500 bermudagrass hay samples showed an improved quality. This county-wide effort has improved the income of these hay producers.

Research trials conducted at the Division of Agriculture Experiment stations at Batesville and Fayetteville were used to select the appropriate bermudagrass for Johnson County producers. In 2004, five producers sprigged improved bermudagrass varieties on 350 acres in Johnson County. Based on the long-term research results, these fields were established in the spring so producers were able to utilize the hay and forage for the 2004 grazing and haying season.

Number and Names of Counties Involved – 3: Benton, Johnson and St. Francis

CES Section Contact Person – Kevin Norton, St. Francis County Extension Agent - Agriculture, 870-261-1730, knorton@uaex.edu; Robert Seay, Benton County Extension Agent - Agriculture, 479-271-1060, rseay@uaex.edu; and Blair Griffin, Johnson County Extension Agent - Agriculture, 479-754-2240, bgiffin@uaex.edu

Program Response: Horse Management

Contact: Steve Jones, Animal Science Section, 501-671-2067, sjones@uaex.edu

Situation

The horse industry is growing in Arkansas. Approximately 60,000 households own 160,000 to 170,000 horses. Although recreation is the number one reason for horse ownership, the horse industry is a \$3 billion industry.

Stakeholder Input

The Arkansas Department of Correction may be the largest horse operation in Arkansas with an inventory of 571 head; a breeding herd of 58 mares and 7 stallions, with the balance being saddle horses, weanlings, yearlings and two-year-olds. On any given day, the Department of Correction may use 130 saddle horses at the various units around the state. The Extension equine specialist was asked to develop four programs: one for the inmates that do the horse breaking and training and three for all the officers that ride horses.

The Arkansas Legislature passed Act 540 in 2001 that requires all horse events to have an EIA Verifier. The Arkansas Cooperative Extension Service, Arkansas Livestock and Poultry Commission and the Arkansas Horse Council were mandated to administer the EIA Verification Program.

Overview

Arkansas has an approximate equine population of 160,000 to 170,000. Approximately 60,000 households have horses. A combination of horse maintenance costs, capital investment and support costs makes this a \$3 billion industry. Recreation is the number one reason for horse ownership with trail riding, weekend horse shows and rodeo events the leading pastimes. Although a thoroughbred racetrack contributes to the local economy seasonally through training facilities and on-site wagering, a number of thoroughbred breeding farms operate year-round in the state.

The Horsemen's Short Course continues to be a popular educational delivery system for Arkansas horse owners. The three-session curriculum includes nutrition, horse health, safety, hoof care, tack and equipment and horsemanship principles.

Positive Reinforcement for Excellent Performance (PREP I) Training Program was developed to show horse owners how to utilize horse psychology, behavior and social structure in training young horses as well as correcting faults of older horses. In 2003,

PREP II was implemented, which is an advancement of PREP I. This program teaches advanced horsemanship skills and incorporates clientele instruction with their horses.

In 2004, a statewide Horsemanship School was taught at the Pauline Whitaker Animal Science Arena. The three-day, hands-on program emphasized basic horsemanship, behavior and training methods. Students brought and learned on their own horses.

The Arkansas Department of Correction requested a number of different equine educational programs in 2004. An eight-hour program, which included basic horsemanship, bits and their functions, saddle fit, firearm safety while on horseback and working with problem horses, was delivered to all officers who ride horses. An advanced horse-training class was prepared for officers responsible for supervising employees that ride horses. This program was a five-day, 40-hour curriculum that was implemented in March 2004. Each officer started a two-year-old from first handling to basic riding. It was intended that all horses would be ridden with some basic horsemanship principles applied by week's end. A new program was developed for the horse barn supervisor. This eight-hour in-service emphasized horse nutrition, hoof care and horse health.

The teaching curriculum and visual aids for the Arkansas EIA Certification Program were revised and updated in cooperation with the EIA Verification Program Committee. The curriculum included a notebook that explains the purpose of the program, EIA procedures, Arkansas legal forms, explanation of ACT 540, horse identification, and outlines proper conduct of EIA verifiers. In 2004, a DVD was developed to be used by county faculty to provide individual instruction of the EIA program and certification.

In the fall of 2003, CES initiated a plan to develop a comprehensive equine educational program. A committee of horse producers and allied industry representatives was formed. This committee defined future programming and job description of an equine specialist. Along with the committee, a prospective donor list was established. Throughout the year, prospective donors were contacted.

Extension Program Results and Accomplishments

Output Indicators

- | | |
|-------|---|
| 6 | PREP training sessions conducted. |
| 1,200 | Number of clientele attending PREP courses. |
| 8 | Number of Horsemen's Short Courses taught. |
| 3 | Arkansas Department of Correction horsemanship in-service sessions for officers. |
| 150 | Number of participants in the Arkansas Department of Correction horsemanship in-service sessions. |

15	Number of Arkansas Department of Correction barn supervisors attending horse training classes.
1,800	Number of participants receiving EIA Training and Certification.
60	Number of county agents trained as EIA program verification instructors.
85	EIA training sessions conducted.
1,300	Number of producers attending educational programs (including Extension-related industry meetings), field days, etc., and receiving educational material.
8	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on general horsemanship and equitation.
4	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse nutrition.
48	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on pasture management and hay quality.
16	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse health.

Outcome Indicators

500	Number of participants who improved their equitation and horsemanship skills.
400	Number of participants who changed their horse nutrition management practices.
50	Number of participants who changed their horse grazing management practices and improved hay quality.
70	Number of participants who changed their horse health management practices.
100%	of participants in the Arkansas Department of Correction horse training in-service were successful in applying horsemanship riding principles.

Source of Funds

Smith-Lever, Arkansas Livestock and Poultry Commission, and Industry Sponsorship (Purina Feeds and Nutrena Feeds).

Scope of Impact

Dissemination – Program activities were available county and statewide as well as regionally through UAEX web site.

Scope of Program – State Specific. 21 Counties: Arkansas, Carroll, Cleburne, Conway, Desha, Drew, Faulkner, Hot Spring, Izard, Jackson, Jefferson, Lincoln, Logan, Madison, Pike, Pulaski, Randolph, Stone, Van Buren and Washington.

Programs of Excellence

It's Not Just Horsin' Around

Success Story – With the influx of urban development in Northwest Arkansas and in the Little Rock area, many of the large farms are being converted into small sections that are big enough for a house and a few horses. Many of the people who own horses do not come from a background that enables them to have a full understanding of the importance of good pasture management, especially for horses.

The focus of this program was to promote forage production in small areas where horses are kept for grazing. Producers were given training in plant and weed identification, soil sampling and fertility, rotational grazing and forage management.

Approximately 400 acres were soil sampled and given fertility, seeding, weed control and forage management recommendations. Seven producers who had never utilized the Extension Service before implemented forage management practices.

The goal of the Pulaski County Horse and Pasture Care Program was to increase the knowledge of these families moving to the country and provide them with the resource information so they can properly care for their animals and pastures. During the year, 36 horse owners were visited to develop pasture management and horse care plans.

Number and Names of Counties Involved – 2: Pulaski and Washington

CES Section Contact Person – Julie Speight, Washington County Extension Agent - Agriculture, 479-444-1755, jspeight@uaex.edu, and Allan Beuerman, Pulaski County Extension Agent - Agriculture, 501-340-6650, abeuerman@uaex.edu

Program Response:

Impact of Water Quality on Poultry Production

Contact: Dr. Susan Watkins, Extension Poultry Specialist, 479-575-7902, swatkin@uark.edu

Situation

Earlier surveys suggested that the quality of water consumed by poultry could affect their health and growth rate. Field and applied studies confirmed these earlier findings. In addition, these studies suggested that producers could control the quality of water delivered to the birds by their watering systems.

Stakeholder Input

Poultry producers are always interested in management tools that will help them produce birds more efficiently. Informal discussions about field and applied water quality studies with poultry companies and poultry producers indicated that water quality management was a subject of intense interest.

Overview

Applied and field water quality studies documented management techniques. Newsletter and popular press articles provided the program initial visibility among production personnel. Presentations at local, regional, state and national meetings informed interested parties of the program and its progress. Troubleshooting and one-on-one consultations provided producers experiencing water quality problems with timely guidance.

Extension Program Results and Accomplishments

Output Indicators

- 7 Field and applied research trials.
- 5 Popular press or newsletter articles.
- 25 Presentations at local, regional or state meetings.
- 3 Training workshops for area poultry producers.

- 78 Farm visits and one-on-one consultations.
- 3,409 Poultry producers were instructed on water quality management.

Outcome Indicators

- 749 Poultry producers changed their water quality management practices.
- 8 Poultry production complexes improved bird performance, saving an average of \$750,000 in production costs annually.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – This program is available to all poultry producers within the state.

Scope of Program – This program was delivered in Arkansas and Texas.

Program Response: Poultry Breeder Management Training

Contact: Dr. Keith Bramwell, Extension Poultry Specialist, 479-575-7036,
bramwell@uark.edu

Situation

The success of any poultry complex depends largely on how well breeder birds are managed. Yet annual genetic improvements mean that the management requirements of breeder birds also change. In addition, there is a dearth of individuals who fully understand current management requirements and the information available to poultry producers and production personnel.

Stakeholder Input

The breeder management meeting was established in 1998 at the request of industry production personnel. The seminar was well received, and more intensive training was requested. Breeder roundtable meetings were established in three locations within the state and continue to meet quarterly to provide program input.

Overview

Extension poultry specialists developed an intensive two-day breeder workshop that presented the latest research-based information as well as hands-on experience with current evaluation procedures. Presentations at local, regional, state and national meetings highlighted the program and its accomplishments. Newsletter and popular press articles outlined the progress of the project. Breeder roundtable meetings were established to keep in touch with the educational needs as well as the impact of the training. Follow-up visits to facilities addressed specific or unusual breeder problems.

Extension Program Results and Accomplishments

Output Indicators

- 8 Intensive workshops conducted.
- 23 Meeting presentations.
- 38 Follow-up visits.
- 4 Breeder roundtable meetings.

Outcome Indicators

- 285 Breeder managers received training.
- 24 Problems were corrected during follow-up visits, saving each company an average of \$51,000 per occurrence.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – Breeder management workshops were conducted in Arkansas and Texas.

Scope of Program – Breeder management training is available to any breeder producer interested.

Program Response: Poultry Hatchery Management Training

Contact: Dr. Keith Bramwell, Extension Poultry Specialist, 479-575-7036,
bramwell@uark.edu

Situation

Hatchery management has always been an acquired skill. Modern hatcheries are increasingly complex because of the changing genetics of breeder birds and increasingly complex machinery.

Stakeholder Input

Informal discussions with hatchery managers indicated the need for additional training. In addition, a quarterly hatchery managers' roundtable was established, which provided on-going guidance to the program.

Overview

An intensive two-day breeder workshop that presented the latest research-based information as well as hands-on experience with current evaluation procedures was developed. Presentations at local, regional, state and national meetings highlighted the program and its accomplishments. Newsletter and popular press articles outlined the progress of the project. Hatchery roundtable meetings were established to keep in touch with the educational needs as well as the impact of the training. Follow-up visits to facilities addressed specific or unusual hatchery problems.

Extension Program Results and Accomplishments

Output Indicators

- 6 Intensive workshops conducted.
- 13 Meeting presentations.
- 16 Follow-up visits.
- 4 Hatchery roundtable meetings.

Outcome Indicators

- 186 Hatchery managers received training.
- 8 Problems were corrected during follow-up visits, saving each company an average of

\$35,000 per occurrence.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – Hatchery management workshops were conducted in Arkansas and Texas.

Scope of Program – Hatchery management training is available to any hatchery worker interested.

Program Response: Poultry Producer Education Program

Contact: Dr. Susan Watkins, Extension Poultry Specialist, 479-575-7902,
swatkin@uark.edu

Situation

As the U.S. poultry industry meets the challenge of being competitive in a highly competitive global market, it will rely more on educational opportunities provided by the Extension Service to choose wise investments and develop better production strategies. Global competition has resulted in profit margins that are very narrow, and the poultry industry has cut costs by increasing the responsibilities of live production personnel. This makes it difficult for production personnel to have the time and resources to learn and understand the value of the latest technologies. Extension has developed a crucial role in providing unbiased and sound technology through quality educational programs. Since the role of Extension is education and not selling products, the clientele served has a high level of trust and confidence in the information provided.

Stakeholder Input

Poultry company personnel meet with Extension personnel to plan programs for contract growers. Program participants provide feedback through surveys. Overall survey response has rated the educational value of programs as high, and company personnel and growers have unanimously agreed that programs should be continued.

Overview

Poultry Expo programs presented the latest production information, while trade shows featured equipment and services utilized by producers. A quarterly newsletter provided producers with up-to-date information, and farm visits assisted producers who were having difficulties. Farm visits and one-on-one consultations provided producers with the technical information necessary to solve difficult management problems.

Extension Program Results and Accomplishments

Output Indicators

- 3 Poultry Expo Programs.
- 18 Management related newsletter or popular press articles published.
- 87 Farm visits or one-on-one consultations.

Outcome Indicators

- 1,300 Producers received the latest production information.
- 56 Producers learned proper bird management techniques.

Source of Funds

Expo registration fees and Smith-Lever.

Scope of Impact

Dissemination – This program is available to all poultry producers within the state.

Scope of Program – This program was presented in Arkansas.

KEY THEME: MANAGING CHANGE IN AGRICULTURE
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Program Response:
The Future of Contracts in Agriculture

Contact: Janie Simms Hipp, J.D., LL.M., 479-575-6935, Environment and Natural Resources; H.L. Goodwin, Ph.D., 479-575-2283, Department of Agricultural Economics and Agribusiness

Situation

In order to become more competitive, modern agriculture has been moving into what may be known as the “contracts age.” Contracts between producers and processors have been at the forefront of the rapid structural change to U.S. agriculture. Contracts dominate and guide the interrelationships of parties throughout the modern production system. First adopters of new technologies and production methods are in the forefront of examining positive and negative impacts of those adoptions. The Oklahoma, Arkansas, Missouri region is the home of many of the country’s leading poultry processing companies and has become the home of many concerns regarding the environmental impact that production operations may be having on the environment. A growing number of lawsuits have been filed in this region concerning those issues. While this has been occurring, the federal regulatory bodies have been considering, but have later dropped, the effort to tie environmental regulation to the contractual relationship that ties the producer and the processor together. In a unique move, and not unrelated to the environmental litigation occurring in the area, the Oklahoma Attorney General issued an opinion that under certain circumstances the relationship between the parties to a poultry production contract may be one of employer/employee as opposed to the traditional position taken by the parties to that contract as it being grounded on an independent contractor status. That opinion is at issue in one of the pieces of litigation pending in this region. Should this opinion be upheld and the nature of the relationship between the parties shift to one of employer/employee, there will be implications to the larger structure of agriculture, particularly in the areas of tax liability, environmental liability, financial/credit access and related implications, entitlement to farm program payment benefits, entitlement to employment related benefits, insurance and general tort liability and management implications across companies and farms. Exploring the implications of such change through an informed dialogue and involvement in a more public setting of the various stakeholders’ perspectives is needed.

Stakeholder Input

Initial project partners in this effort were the Farm Foundation, the National Association of State Departments of Agriculture, the American Farm Bureau Federation and the Arkansas Farm Bureau. The Division of Agriculture provided leadership and support. The entire program effort thus far has been grounded on bringing the discussion into a multi-stakeholder arena. The first efforts of this program effort were a successful conference that was specifically designed to encourage maximum cross-issue stakeholder input and involvement.

Overview

Truth or Consequences: The Future of Contracts in Agriculture was a nationally publicized event conducted in September 2003 in Kansas City. The event brought together a broad audience of interested parties to begin the public dialogue that would form a comprehensive approach to the use of contracts in agriculture. The use of contracts is pervasive, however, there are numerous public and private entities and organizations that have been urging change in the way contract relationships within the agricultural arena are regulated. The University of Arkansas Division of Agriculture partnered with the Farm Foundation, the National Association of State Departments of Agriculture, the American Farm Bureau Federation and the Arkansas Farm Bureau, to begin this dialogue. The agenda for this event and PowerPoint presentations of speakers can be found currently at the Farm Foundation web site and the release of a CD incorporating this and transcription of proceedings was disseminated. A follow-up on NRI grant application has been submitted with other key players including the Missouri contracts study center CORI and the ERS. Follow-ups on conferences are in the planning stages around the issues of supply chain management, access to capital, federal and state policy responses and conflict management within the contract system.

Extension Program Results and Accomplishments

Output Indicators

A CD was edited and released to participants and all presentations from 2003 continue to be posted on the Farm Foundation web site. Follow-up activities have continued after the event, including partnering with the Contract & Organizational Research Institute (CORI) of Columbia Missouri and the economic research service, USDA to prepare and submit an application for funding future events and related research. While these applications were not funded, the partners continue to collaborate and recently were featured on the agenda for the discussion of these issues at the Southern Region Agriculture Scientist meetings in Little Rock, Arkansas.

Outcome Indicators

We are encouraged by the initial response to the conference that occurred in September 2003. Additional litigation around these issues occurred and is still pending in a variety

of jurisdictions. Our efforts are to increase the knowledge base for those persons affected by contract usages and our efforts to engage a broader research and academic community with the regulatory community is already having positive impact in that numerous additional follow on grant applications have occurred and additional dialogue continues.

Source of Funds

Funding for the September 2003 program effort was provided through the Farm Foundation, the National Association of State Departments of Agriculture, the American Farm Bureau Federation, and the Arkansas Farm Bureau, as well as support from the University of Arkansas Division of Agriculture.

Scope of Impact

Dissemination – CD and web site materials are accessible nationwide through the Farm Foundation web site and through the University of Arkansas Fayetteville web site. Over 5,000 mailings advertising the event were sent out. The four follow-ups on conferences are preliminarily scheduled for four different regions of the country and as the planning for those events progresses, additional mailings and public access to information will occur.

Scope of Program – While the initial litigation spurring interest in this program effort is involving citizens of Arkansas and Oklahoma, the effect of such contemplated and argued changes will be felt nationally and globally. Therefore, the scope of the program is national in nature.

KEY THEME: RISK MANAGEMENT

**Program Response:
Native American Agricultural Producers**

Contact: : Janie Simms Hipp, J.D., LL.M., 479-575-6935, Environment and Natural Resources; Jennie H. Popp, Ph.D., 479-575-2286, Department of Agricultural Economics and Agribusiness

Situation

There are currently nearly 562 federally recognized Tribal Nation governments in the United States. Within these Nations are agricultural producers who are women, limited resource farmers and ranchers, and these producers are among the traditionally underserved populations. Even so, recent Agricultural Census data indicate that the numbers of underserved producers is on the rise. Agricultural producers within Tribes historically have had little access to specialized agricultural production and resource management information for a number of reasons. First, the traditional link to Extension and land grant institutions is not nearly as strong as the Tribal members' link to his or her own Tribe. Many Tribal governments do not have existing infrastructure of specialized knowledge or support for agriculturalists, or may only now be taking the initial steps to develop such knowledge base and support. Furthermore, Tribal members in many states are dispersed; in other states they are engaged in agricultural efforts on reservations. Tribal leaders do not always possess reliable data regarding the extent of agricultural production and the natural resource management and agricultural production education needs within their communities. Arkansas was the home of many Tribes whose original homelands were in the southeastern United States and who were removed to Indian Territory (now Oklahoma.) The University of Arkansas has long recognized this link between Arkansas and the Tribal Governments in that it offers in-state tuition status to those persons who are members of seventeen different Tribes who made their home in early Arkansas Territory. Two University of Arkansas research and Extension personnel identified the need to provide targeted information and outreach to Native American producers. One of these professionals is a member of the Chickasaw Tribe of Oklahoma, has a history of working with Tribal governments in Oklahoma, and is a lawyer. The other is an agricultural and natural resources economist. Both are women. Through their initial interest in this area, a growing body of work is developing, focusing on the needs of Native American producers with the focus on encouraging the development and increasing the body of knowledge and education on a wide variety of issues that affect traditionally underserved producers.

Stakeholder Input

Early stakeholder input on these efforts was with the American Indian Center of Arkansas, an organization providing educational and job linkage to the Native American community (and which is the project leader in efforts to have the Trail of Tears recognized as a national park area). We were able to establish early strong linkages with the Cherokee Nation of Oklahoma and the Choctaw Nation of Oklahoma. These two nations' land holdings account for roughly one-third of the entirety of the eastern part of Oklahoma. Year two stakeholder linkages are being established in Mississippi and further west within the state of Oklahoma to approximately thirteen additional Tribes. During year two of this program effort (years one and two funded under USDA Risk Management Agency grants), we were able to secure funding for a three-year project (2004-2006) that will focus on the risk management needs of Native American Women in Agriculture. Our work in this broader community is just beginning, but this later project will build on early relationships and will establish new relationships with Tribal members and Extension Reservation personnel throughout the United States. Stakeholder input is critical and key to the delivery of any substantive educational tool within the Native American community. Our project approach is to develop relationships through soliciting, receiving and incorporating stakeholder input from a variety of sources within the Tribal community: the agricultural liaison (should one exist); the land resource managers, the environmental managers, the educational managers, and the Chief/Governor/Chairman's office. This approach has been generally accepted. We also have been happy to incorporate the Intertribal Agricultural Council as a key stakeholder and participant on these efforts with us.

Overview

Our program efforts in this area began in FY 2003 with an initial RMA grant to do educational training and outreach among Tribal groups in Oklahoma. We had initial success in that program and were able to secure funding for FY 2004 of a renewal grant to continue our efforts westward in Oklahoma and in Arkansas and Mississippi. We have conducted numerous farm shows, targeted public educational sessions and have written and published/disseminated a risk management guide (250+ pages) for Native American producers. We were able to secure a three-year grant to continue these sorts of efforts at risk management education targeting the Native American Women in Agriculture throughout the southeast, mid-south and southwestern United States. Our program efforts are just beginning but we anticipate this will prove to be an important project. The project was funded by CSREES. In our programming, we have specifically solicited comments and suggestions regarding areas of need, while also interjecting standard or developing bodies of information. Risk management is the focus of our educational efforts, but this necessarily incorporates a wide array of topics from production management of risk, diversification, to legal issues that might face the producer, to estate and business planning. The substantive information contained in the educational offerings is easily

accessible by a wide variety of traditionally underserved or minority or limited resource agricultural producers.

Extension Program Results and Accomplishments

Output Indicators

A 250+ page risk management guide has been developed and disseminated throughout the Tribal nations in Oklahoma. We updated this guide and continue to update on a web site for further dissemination within the southeast, mid-south and southwestern states as well as in conjunction with the Women in Agriculture project. That guide will, at the conclusion of the women in agriculture effort, be available throughout the United States and will have targeted audiences within the 380 Tribal nations. We are in planning stages for bringing on line a dedicated web site for these efforts. We also have attended at least one dozen farm shows in the region and conducted half a dozen targeted educational presentations on these issues. The Intertribal Agriculture Council has published an article outlining these program efforts in their 2004 newsletter offerings and this newsletter is available on line and throughout the Tribal nations.

Outcome Indicators

As our presence on these issues continues, we are noticing an increase in numbers of calls we receive monthly from Tribal Nations. We keep in close contact with the Choctaw and Cherokee Nations, but the impact of the effort is broadening to other Nations as well. As the program proceeds, we will be able to better gauge outcome. Activities in the area have been publicized alongside numerous Inter Tribal events throughout the country, such as the annual Inter Tribal agriculture council meeting, the Southwest Indian Agriculture Association meeting, and the Inter Tribal National Reservation Conservation Association. Future events are in the planning stages.

Source of Funds

Funding for the initial effort and a renewal grant continuing the effort came from the USDA Risk Management Agency. Additional funding into this body of work is from CSREES.

Scope of Impact

Dissemination – Educational materials are available in written form now and will be ultimately available on line through a dedicated web site focusing on these particular producers. Over 100 copies of the initial materials have been made and disseminated. The CSREES portion of the program effort will result in additional publications, additional mailings of existing publications and will involve numerous meetings throughout the southern states.

Scope of Program – While beginning with Oklahoma and Arkansas, the second phase of this effort was broadened to Oklahoma, Arkansas and Mississippi. Additional work was further broadened in efforts throughout the southern states.

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

While the American food supply is among the safest in the world, each year millions of people are stricken by illness caused by the food they eat. The Center for Disease Control and Prevention (CDC) estimates that foodborne diseases cause approximately 76 million illnesses, 325,000 hospitalizations, and more than 5,000 deaths in the U.S each year. The cost estimate of foodborne pathogens, including medical costs, productivity losses from missed work, and an estimate of the value of premature death is \$6.9 billion.

Arkansas agricultural producers play a key role in supplying food for the state, nation, and world. The largest segment of livestock produced in the state is poultry and eggs, contributing over \$674 million to the economy. Cattle production is the most widespread segment of livestock enterprises and contributes \$139 million. Field crop production is also a vital contributor to the state economy, with Arkansas being the leading rice-producing state. The total impact of agriculture on the gross state product is over \$13 billion and accounts for 15 percent of the state's total payroll. A single disease outbreak could drastically affect our ability to keep our animals and plants healthy. Furthermore, an outbreak even on a very limited scale could undermine consumer confidence in the food supply, leading to economic disaster for agricultural producers and the state's economy.

Livestock and crops produced in the state are stored, handled and further processed in state, and a significant portion are shipped out of state for storage and/or further utilization. Livestock auctions, grain elevators and mills, feed lots, and the trucking industry are allied industries associated with the storage, handling, and movement of crops and livestock. In addition, some on-farm storage and handling of livestock and crops occurs, and the industries involved in further processing of crops and livestock in state also have some degree of local on-site storage and handling methods.

Food processing plays an integral role in the Arkansas economy, but incidents of foodborne diseases pose a major threat to food processors and the general public. Food processing companies share a cost burden for food safety because of market loss due to sales of contaminated products, lawsuits by consumers, and government regulations. The future prosperity of the Arkansas food processing industry is contingent on delivering a safe and secure food supply.

As the dollar amount spent by Arkansas consumers on food eaten away from home has increased, so too has the extent to which restaurants and other food service establishments impact the health and well-being of our residents. The restaurant industry's share of the food dollar is currently 46.4% and is estimated to rise to 53 percent by 2010. The impact of foodborne diseases on health in the United States is

considerable. According to the CDC, the percentage of people in industrialized countries suffering from foodborne diseases each year has been reported to be as high as 30 percent.

Emerging pathogens and hazards in the food chain, a growing awareness and threat of bioterrorism, and food contamination as a result of increased utilization of imported foods are public concerns that are being addressed by the University of Arkansas Division of Agriculture - Extension through continued research and consumer education.

To ensure that the food supply is safe and secure for Arkansans, research and education is critical at each step of the food chain from the farm to the table. Specifically, educational efforts have been focused in four areas: production, post-harvest storage and handling, processing, and consumption.

Arkansas' Cooperative Extension faculty and staff work to ensure and support an adequate and safe food and fiber supply through implementation of science-based detection, surveillance, prevention, and education. Outreach educational programs are tailored to benefit all economic and education levels throughout the state. Utilization of the Internet and other broad scale broadcasting techniques have assisted with increasing contacts.

Total FTEs

9.41

Total Budgetary Amount

\$475,525.70

**KEY THEME:
FOOD QUALITY**

**Program Response:
Food Processing Extension**

Contact: Steven C Seideman, Institute of Food Science and Engineering, 479-575-4221, seideman@uark.edu

Situation

Food processing is a large business in Arkansas. About 25% of all manufacturing in Arkansas is food processing, representing an \$11 billion per year business. There are 232

food processing establishments in Arkansas directly employing over 55,000 people. Although rice and poultry processing may, in part, be located in Arkansas due to the proximity to raw materials, a number of food processing establishments are in Arkansas due to 1) good, economical labor force, 2) access to the interstate road system, 3) central location in the U.S. and 4) status as a “right to work” state. Since many large, national food processors have processing facilities in Arkansas because of the above-mentioned factors, it is reasonable to assume that smaller food processing businesses and entrepreneurs can capitalize on these advantages and establish successful businesses. The state of Arkansas is dedicated to its food processors and is committed to providing assistance to existing food processors as well as helping entrepreneurs get into the food processing business. By attending to the needs of big processors, we can keep them in the state and possibly attract new businesses to Arkansas. By attending to the needs of entrepreneurs, we can help create new businesses and jobs.

Stakeholder Input

In 2002, 232 surveys were mailed out to all food processors in Arkansas from a list obtained from the Arkansas Economic Development Commission. The surveys asked what existing food processors in Arkansas wanted in the form of assistance from a Food Processing Extension position. In addition, over 20 person-to-person interviews were conducted with some of the larger food processors in Arkansas. The responses from the mailout surveys and the interviews were very similar as far as the top three requests. Listed below is the percentage of positive responses for the main three activities requested.

<u>Activity Requested</u>	<u>% Response from Mailout Survey</u>	<u>% Response from Interviews</u>
Website/ Newsletter	82%	80%
Web-based Education Courses	69%	60%
Workshops on Food Safety and Quality	65%	60%

The above survey shows the requests of established food processors but does not address the needs of entrepreneurs. Based on telephone calls from entrepreneurs, their requests range from information on starting a food business, to finding a copacker, to various assistance we already offer (pH determination, nutritional labeling, etc.).

A new stakeholder has recently come forth requesting assistance. The Arkansas Department of Health is currently undergoing reorganization and is inquiring into the possible development of online educational programs to train their inspectors well as educational programs for restaurants and food processing establishments.

Overview

Prior to the fall of 2002, Food Processing Extension (0.5 FTE) consisted of having one Better Process Control School per year, conducting two workshops per year (usually on the subject of Starting a Food Business), and responding to telephone calls primarily from people wanting to enter the food industry.

In the fall of 2002, mailout surveys to all food processors in Arkansas and interviews with large food processors in the Arkansas (as discussed in Stakeholder Input section above), led to the planning and development of a comprehensive Food Processing Extension program for Arkansas. This program's overall objective became "To provide educational programs, applied research, support services, and assistance to the existing large commercial food processors, small food processors, and entrepreneurs." Based on surveys, interviews, and new information continuously becoming available, the following initiatives were developed and implemented in 2003-2004 or are planned to begin in 2005.

- 1) Food Processing website/Newsletter – Launched January 2003.
- 2) Web-Based Educational Programs – Started in May 2003. To be completed by July 2005. This is 52 one- hour PowerPoint presentations with narration available free on the web. This program will need strong promotion in Summer 2005.
- 3) Support Services, such as pH, nutritional labeling, finding copackers, etc., are in place.
- 4) Workshops – Planned for Spring-Fall 2005. By using the educational web-based programs, a series of workshops mainly involving food quality and starting a food processing business will be initiated in Spring.
- 5) Applied research for larger packers – To be started in Summer 2005.

Extension Program Results and Accomplishments

Output Indicators

- | | |
|-----|--|
| 256 | Number of telephone calls from the food industry and entrepreneurs requesting assistance |
| 1 | Number of independent workshops. |
| 4 | Number of workshops assisted with but not as a primary coordinator (mostly producer groups). |
| 147 | Number of support services provided (pH, nutritional labels, etc.). |
| 72 | Hits on website. |

- 18 Acted as High Acid Processing Authority.
- 30 Number of one-hour educational programs developed.

Outcome Indicators

- 29 Certificates issued for Better Process Control School held in accordance with FDA provisions in November 2003.
- 17 Businesses started due to Extension.

Source of Funds

Funds are from a special CSREES grant to the Institute of Food Science & Engineering.

Scope of Impact

Dissemination – This program is available to residents of the state. Free web-based educational programs are available nationwide.

Scope of Program – State specific.

Program Response: Grain Storage and Drying to Preserve Quality with Minimal Losses

Contact: Dennis R. Gardisser, Biological and Agricultural Engineering, 501-671-2241, dgardisser@uaex.edu

Situation

Much of the corn, soybeans, wheat and rice harvested each year is placed in farm bins for drying and storage. Some of this grain is held for short periods or only until dried. Many crops may be held as long as one year. Drying management and insect control have a significant impact on the quality of stored grains.

Stakeholder Input

Producers continually request additional assistance with management strategies and help with economic analysis.

Overview

Several producer programs were conducted to discuss general management procedures for those growers using on-farm grain storage and drying. Growers were instructed regarding how to optimize the use of existing facilities, with the primary emphasis being efficiency and grain quality. Several workshops were conducted with commercial operators to enhance the quality of grain in the end product after storage. These programs were conducted with the cooperative assistance of the peer research group.

Engineers continue working with Arkansas Department of Corrections (ADC) to develop the most efficient operating guidelines for their new grain drying facility. Extension engineers are participating in the third year of a joint research project with food processing engineers and the staff at ADC to investigate ways to control insects in rice storage other than using chemicals. This research effort expanded this year to two other farms in the state.

A major training session was conducted during October 2004 to review on-farm practice recommendations. Sessions were held in Missouri, Arkansas, and Texas.

Extension Program Results and Accomplishments

Output Indicators

- 15 Producer meetings to discuss grain drying and storage.
- 25 On-farm visits to work hands-on with producers on grain bin management strategies.
- 2 Research demonstration projects in full-size bins.
- 7 Popular press articles.
- 500 Producers attended meetings on grain drying.

Outcome Indicators

- 188 Arkansas producer responses to a mail-out survey on current on-farm handling and drying practices.

Source of Funds

FSL, CSREES grant, and Rice Research Promotion Board grant.

Scope of Impact

Dissemination – This is a statewide and regional program that has been made available to all producers. A web page was developed to distribute the information and software programs that were developed.

Scope of Program – Programs were presented in 20 of the primary grain drying counties in Arkansas and Missouri.

KEY THEME:

FOOD SAFETY

Program Response:

Food Safety Education Programs/ServSafe

Contact: Dr. Russ Kennedy, Health and Aging Specialist, 501-671-2295, Family and Consumer Sciences, rkennedy@uaex.edu

Situation

The reported incidence of foodborne illness from pathogenic bacteria is increasing. Centers for Disease Control estimates foodborne pathogenic bacteria cause 76 million illnesses, 325,000 hospitalizations, and 5,200 deaths in the United States each year. Known pathogens account for an estimated 14 million illnesses, 60,000 hospitalizations, and 1,800 deaths annually. Changing patterns of consumption, an aging population, more variation in food handling, and preparation practices are contributing to increased vulnerability of the population to foodborne disease. A key to reversing the trend of increased disease is education for consumers and food handlers throughout the food production and marketing system.

Stakeholder Input

County faculty identify and build linkages with other organizations in an effort to plan and deliver educational programs. Input on programming is also received from the County Extension Councils.

Overview

Programming in food safety education is focused on at-risk individuals such as pregnant women, parents of infants, older adults, limited resource youth and adults, home food preservers/preparers, and commercial food handlers.

Extension Program Results and Accomplishments

Output Indicators (Consumers)

304 Number of consumers participating in educational short courses or meetings related to sanitation and safety in food handling.

4,444 Number of people reached through food safety awareness programs, demonstrations, or displays.

88 Number of media articles produced on food safety issues.

Output Indicators (Producers)

140 Number of participants in educational programs leading to certification for food handlers (i.e., ServSafe programs and Better Process schools).

54 Number of non-certified programs for food handlers.

43 Number of participants attending non-certification programs for food handlers.

4 Number of growers, producers, distributors, or retailers attending food safety educational programs.

Outcome Indicators (Producers)

137 Number of food handlers certified.

4 Number of growers, producers, distributors, or retailers implementing one or more practices to minimize food safety hazards.

Source of Funds

Smith-Lever and cost recovery fees collected for ServSafe.

Scope of Impact

Dissemination – Program available statewide. A limited amount of food safety information is available on University of Arkansas Extension Service web site: www.uaex.edu.

Scope of Program – ServSafe is conducted through 16 county clusters. Counties conducting ServSafe programs in 2004 included Pope, Greene, Craighead, and Pulaski. Additional food safety programs are likewise conducted statewide.

**KEY THEME:
FOOD SECURITY**

Program Response: Homeland Security

Contact: Dennis R. Gardisser, Biological and Agricultural Engineering, 501-671-2241, dgardisser@uaex.edu

Situation

Terrorist attacks on September 11, 2001, have changed the relaxed paradigm within the agricultural chemical community.

Stakeholder Input

Producers continually request additional assistance with management strategies and help with economic analysis.

Overview

Cooperative efforts have been conducted with the Transportation Safety Administration (TSA), FBI, and others to increase awareness among the agricultural community.

Extension Program Results and Accomplishments

Output Indicators

- 20 General aviation meetings to review safety procedures.
- 22 Agricultural aviation meetings to increase awareness of concerns about commercial aerial applications.

Outcome Indicators

Aviators are now more aware and are installing and implementing more security measures.

Source of Funds

FSL

Scope of Impact

Dissemination – This is a statewide program. Programs were also presented in Mississippi, Louisiana, Texas, and Missouri.

Scope of Program – This program has been made available to all the Arkansas aviation community and to the surrounding states.

KEY THEME:

FOODBORNE PATHOGEN PROTECTION

Program Response:

Thermal Process Validation Workshops

Contact: Dr. John Marcy, Extension Poultry Food Scientist, Poultry Science Section, 479-575-2211, jmarcy@uark.edu

Situation

Poultry processing plants produce nearly a billion pounds of ready-to-eat poultry products annually, and consumers depend on the safety of these foods. Yet recent experience has shown that the personnel in some plants do not understand the principles necessary to verify the production of safe foods. As a result, millions of pounds of product have been recalled and consumers have sometimes been sickened by contaminated foods.

Stakeholder Input

When public health is involved, little stakeholder input should be required. Nonetheless, roundtable discussion with further processing plant officials provided specialists with initial guidance. In addition, these discussions have continued on a monthly basis at a gathering called the HACCP Roundtable. The roundtable includes representatives from every major poultry processor in Arkansas and provides a continuing source of guidance.

Overview

Specialists developed a 2.5-day workshop that presents scientifically valid, practical methods for validating that products have been correctly processed.

Extension Program Results and Accomplishments

Output Indicators

- 1 Thermal Validation Workshop conducted.

Outcome Indicators

- 8 Multinational corporations represented at the workshops.

12 National corporations represented at the workshops.

Companies producing an estimated billion pounds of ready-to-eat products learned scientifically valid methods of ensuring product safety.

Source of Funds

Smith-Lever and workshop registration fees.

Scope of Impact

Dissemination – This program is available to any poultry processor in need of it.

Scope of Program – This program was presented in Arkansas and Indiana.

KEY THEME: HACCP

Program Response:

HACCP and Sanitation Training for the Poultry Industry

Contact: Dr. John Marcy, Extension Poultry Food Scientist, Poultry Science Section, 479-575-2211, jmarcy@uark.edu

Situation

Poultry companies have always been interested in the safety of the food they produce. However, in 1998 federal law mandated that every poultry plant have and follow a HACCP plan. This regulation created tremendous educational needs within the industry due to high employee turnover in poultry plants.

Stakeholder Input

Federal regulations created tremendous incentive for training, and little input was needed. Nonetheless, an informal survey of processing personnel confirmed the need for employee training. In addition, the HACCP roundtable was formed, which provides continuing guidance.

Overview

A 2.5-day intensive workshop that provided processing personnel with an in-depth understanding of HACCP as well as hands-on experience in developing HACCP plans was developed. Specialists also visited plants having difficulty implementing HACCP plans.

Extension Program Results and Accomplishments

Output Indicators

- 8 HACCP Workshops.
- 53 Plant HACCP Implementation visits.

Outcome Indicators

- 287 Workshop participants learned HACCP principles.
- 15 Plants improved their HACCP plans.

Source of Funds

Smith-Lever and workshop registration fees.

Scope of Impact

Dissemination – This program is available to any poultry processor in need of it.

Scope of Program – This program was delivered in Arkansas, Indiana, and Virginia.

Goal 3 – A healthy, well-nourished population.

According to the U.S. Department of Health and Human Services, unhealthy eating habits, coupled with physical inactivity, are now the nation's second leading cause of death. It has been estimated that 14 percent of deaths can be attributed to poor eating and lack of physical activity. Lifestyle factors, such as high-fat diets and physical inactivity, increase the risk of chronic diseases such as heart disease, stroke, certain cancers, and diabetes.

Risk factors for Arkansans include:

- Four of the ten leading causes of death in Arkansas are related to diet (heart disease, cancer, stroke, and diabetes).
- Cardiovascular disease is the leading cause of death in Arkansas.
- High blood pressure affects more than one-third of adult Arkansans.
- The adult diabetes rate in Arkansas is 7.9 percent – one of the highest in the U.S. Approximately 156,000 Arkansans have been diagnosed with diabetes and an estimated additional 78,000 have the disease but are unaware of their condition.
- Arkansas has one of the highest obesity rates with 61 percent of adults being either overweight or obese.
- Childhood obesity in Arkansas has reached epidemic proportions, where 14 percent of children 0-5 years are at risk for becoming overweight and nearly 12 percent are considered overweight. Among school-age children in grades K-12, 17 percent are at risk for becoming overweight and 21 percent are overweight.
- Annual medical expenditures related to obesity in Arkansas are \$663 million. More than half of these dollars come from state and federal government sources.
- Nearly eight out of 10 Arkansans report they are not consuming the recommended five servings of fruits and vegetables a day.
- Almost 79 percent of adult Arkansans are at risk for health problems related to lack of physical activity.
- In a recent report by the U.S. Department of Agriculture, Arkansas was the eleventh worst state in the country in the level of food insecurity (12.6 percent of all Arkansas households were food insecure).

Through research and consumer education on nutrition, the preparation and selection of more nutritious foods, healthy life style choices, and food resource management, Cooperative Extension faculty and staff enable Arkansans to improve their overall health and well-being. Programs target low income families and their children, food stamp recipients, minority audiences, and clientele with specific health concerns, including diabetes and hypertension. Programs are primarily delivered through the Expanded Food and Nutrition Education Program (EFNEP), Food Stamp Nutrition Education (FSNE), Eating and Moving for Life (a minority health initiative), Reshape Yourself (a weight reduction and physical activity program), Walk Across Arkansas (a physical activity program), and the BodyWalk (a program targeting youth and overall healthy lifestyles).

All 75 county Extension programs include some type of programming in health and nutrition education.

Total FTEs

112.03

Total Budgetary Amount

\$3,869,986.95

**KEY THEME:
HUMAN HEALTH**

Program Response:

Reducing Risks for Chronic Disease – Physical Activity

Contact: Dr. Russ Kennedy, Extension Health and Aging Specialist, 501-671-2295, Family and Consumer Sciences, rkennedy@uaex.edu

Situation

Regular physical activity substantially reduces the risk of dying of coronary heart disease, the nation's leading cause of death, and decreases the risk for stroke, colon cancer, diabetes, and high blood pressure. It also helps to control weight, contributes to healthy bones, muscles, and joints, reduces falls among older adults, helps to relieve the pain of arthritis, reduces symptoms of anxiety and depression, and is associated with fewer hospitalizations, physician visits, and medications. Despite the proven benefits of physical activity, more than 50% of American adults do not get enough physical activity to provide health benefits. Almost 36% of Arkansans do not engage in any physical

activity. Arkansas ranks 6th in the percentage of adults who do not participate in any physical activity (the national average is 28%).

Stakeholder Input

County Extension Councils identify specific health issues and programs that should be emphasized in each of their respective counties. The district administrative staff and agents likewise provide consumer feedback to specialists regarding human health and needs for long-range educational programming.

Overview

Extension's health programs, such as Walk Across Arkansas, help Arkansans incorporate physical activity into their lives.

Extension Program Results and Accomplishments

Output Indicators

- 143 Number of educational programs offered that relate to physical activity.
- 1,433 Number of participants attending educational programs related to physical activity.
- 2,938 Number of people reached through awareness programs, exhibits, and media outlets based on topics related to physical activity.
- 13 Number of educational resources prepared related to physical activity.
- 3,164 Number of people who participated in the Walk Across Arkansas walking program.

Outcome Indicators

- 1,423 Number of people who increased physical activity.
- 210,087 Number of miles walked by Extension program participants.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination: The Walk Across Arkansas program is available to all counties. Information regarding the program has been disseminated through direct mailing to counties. Program information includes recruitment techniques, sample news releases,

fact sheets, and sample committee agendas. Program information is also available on the University of Arkansas Cooperative Extension Service web site at www.uaex.edu.

Counties conducting health programs in FY04: Arkansas, Ashley, Baxter, Boone, Benton, Bradley, Calhoun, Carroll, Clark, Clay, Cleburne, Cleveland, Columbia, Conway, Craighead, Crawford, Cross, Drew, Franklin, Fulton, Garland, Grant, Greene, Hot Springs, Howard, Jackson, Jefferson, Johnson, Lafayette, Lawrence, Lincoln, Little River, Madison, Montgomery, Mississippi, Ouachita, Perry, Pike, Poinsett, Polk, Pulaski, Randolph, Scott, Searcy, Sebastian, Sevier, Stone, Van Buren, White, Woodruff, and Yell.

Scope of Program: Approximately 60 counties have indicated interest in implementing this program during FY05.

<p>KEY THEME: HUMAN NUTRITION</p>

Program Response: **Expanded Food and Nutrition Education Program**

Contact: Easter H. Tucker, Associate Professor - Family and Consumer Sciences Specialist, 501-671-2099, Family and Consumer Sciences, etucker@uaex.edu

Situation

Arkansas is a poor state. According to Census 2000, Arkansas ranks seventh in the nation for the highest percent (15.8%) of persons living in poverty. Low educational attainment levels and poor access to public services exacerbate the problems brought on by poverty.

Too many families in Arkansas are food insecure and lack the ability to access nutritionally adequate and safe food. In a recent report by the U.S. Department of Agriculture, Arkansas was the eleventh worst state in the country in the level of food insecurity (12.6% of all Arkansas households were food insecure). When food and nutrients needed to sustain physical and mental well being are chronically inadequate, hunger leads to high medical, educational, psychological, economic, and social costs.

Stakeholder Input

County Extension agents identify and build linkages with community agencies and organizations that provide services and other assistance to limited-resource persons. These collaborations help county staff determine educational needs of low-income

families in their county and to develop, implement, and evaluate educational programs. The partnerships enhance nutrition programs in a number of ways including, but not limited to, serving on the county program advisory committee, referring families to the program and assisting in the recruitment of participants, providing space and meeting sites for lessons, providing child care and transportation, providing meals, snacks or food supplies, and donating incentives and other supplies for programs.

County Extension agents establish and conduct meetings of county advisory committees, consisting of representatives from other community agencies and organizations interested in promoting health and nutrition for low-income populations, to identify specific needs of the target audience and to establish strategies for reaching the audience, such as a referral system.

Overview

The mission of the Expanded Food and Nutrition Education Program (EFNEP) is to empower individuals and families with limited resources to maximize their food dollars and food stamp benefits and to provide a nutritious, safe, and secure meal environment. The mission is accomplished by providing free, informal, and easily accessible educational programs in the home and community.

EFNEP provides food and nutrition education for limited resource audiences in 16 counties in Arkansas. The programs are free, informal and available at convenient locations and times in the home and community. Program assistants, who are indigenous to the target population, deliver intensive, multi-session nutrition education programs. In general, each participating county uses one or more of the methods listed below to deliver nutrition education:

- One-on-one discussions
- Small group, interactive discussions
- Basic meal planning and food preparation demonstrations
- Hands-on learning experiences (experiential learning)
- Videos
- Newsletters
- Educational displays
- Computer programs, such as diet analysis and other nutrition programs

After assessing clientele needs, each county develops its own plan for reaching the target population. The programs focus on developing knowledge and skills related to nutrition and meal planning, food safety and sanitation, food purchasing, storage and preparation, and food budgeting. *Eating Right Is Basic* and *Eat Well for Less* serve as the core curriculum. Every effort, however, is made to address the needs of the client and to deliver meaningful nutrition education.

Extension Program Results and Accomplishments:

Output Indicators

- 15,317 Total number of persons in EFNEP program families.
- 4,519 Families who participated in nutrition education programs.
- 1,562 Youth who participated in nutrition education programs.
- 2,457 Participants who completed 12 or more lessons of intensive nutrition education.

Outcome Indicators

The 2,547 intensive nutrition education program participants were given pre- and post-evaluation instruments that evaluated behavior changes over the course of the program. The evaluation results are as follows:

Nutrition (Dietary Quality) Practices

- 1,394 (93%) Participants showed improvement in at least one or more nutrition practices.
- 914 (61%) Participants thought about healthy food choices more often when deciding what to feed their family.
- 674 (45%) Participants prepared foods more often without adding salt.
- 1,103 (74%) Participants used food labels more often to make healthier food choices.
- 531 (35%) Participants reported that they and their children ate breakfast more often.

Food Safety Practices

- 1,141 (75%) Participants showed improvement in one or more of the recommended food safety practices.
- 397 (26%) Participants more often followed the recommended practices of not allowing meat and dairy foods to sit out for more than two hours.
- 335 (22%) Participants always followed the above recommended practice.
- 1,175 (70%) Participants more often followed the recommended practice of not thawing foods at room temperature.
- 606 (39%) Participants always followed the above recommended practice.

Food Resource Management

- 1,386 (91%) Participants showed improvements in one or more of the recommended food resource management practices.
- 1,032 (67%) Participants planned meals in advance more often.
- 848 (55%) Participants compared prices more often.
- 733 (48%) Participants ran out of food before the end of the month less often.
- 1,016 (66%) Participants used a list for grocery shopping more often.

Source of Funds

Smith-Lever Funds.

Scope of Impact

Dissemination – The core curriculum and other resources, including handouts written at an appropriate reading level, have been made available to each EFNEP county.

Scope of Program – EFNEP was delivered in the following counties: Chicot, Craighead, Crittenden, Desha, Garland, Hempstead, Jefferson, Lee, Ouachita, Phillips, Pulaski, St. Francis, and Union.

Program Response:

Food Stamp Nutrition Education (FSNE)

Contacts: Rosemary Rodibaugh, Extension Nutrition Specialist, 501-671-2111, Family and Consumer Sciences, rrodibaugh@uaex.edu; Beverly H. Hines, Food Stamp Nutrition Education Program Associate, 501-671-2325, Family and Consumer Sciences, bhines@uaex.edu; Jackie Yarbrough, Food Stamp Nutrition Education Program Associate, 501-671-2070, Family and Consumer Sciences, jyarbrough@uaex.edu

Situation

The Arkansas Department of Human Services (DHS) reports that in FY03, 457,888 persons in 176,463 Arkansas households participated in the Food Stamp Program at a cost of \$295,490,235. Among Arkansans receiving food stamps, 219,246 were children and approximately 22,000 were 65 years of age or older.

A recent report by the U.S. Department of Agriculture, Economic Research Service revealed that 15.5% of all Arkansas households were food insecure. Thousands of Arkansans are at risk of being hungry and malnourished because of the poverty level in the state. Women who are food insecure are at higher risk for obesity-related chronic disease.

Research has shown the importance of nutrition to the developing brain and learning capability of children. Students who eat a nutritious breakfast have improved academic achievement, fewer visits to the school nurse, and better behavior in the classroom.

Stakeholder Input

Forty-nine of seventy-five counties in Arkansas participated in Food Stamp Nutrition Education program during FY 2004. County agents in these counties receive input on FSNE programming needs from partner agencies such as public school personnel, local DHS staff, commodity food distribution site staff, senior citizen center staff, Head Start program staff, county health unit Women, Infants and Children (WIC) program staff, county Extension councils, and Food Stamp participants.

Overview

The FSNE program provided nutrition education to food stamp recipients/applicants and other low-income individuals and families through six approved waivers. In conjunction with state and local partners, the FSNE program was delivered in 49 of the 75 counties in Arkansas.

The majority of the FSNE program was delivered through partnerships with public schools where at least 50% or more of the students are eligible for free or reduced-price

lunches. During FY 2004, FSNE had partnerships with 171 eligible schools in 124 school districts. Counties also reached eligible adult clientele through 48 local DHS offices, 12 commodity food distribution sites, one community agency, three senior citizen centers, one housing authority, one low-income community resource center, one low-income housing facility, 21 Head Start programs, and 11 county health unit WIC programs.

Education classes, on-site demonstrations, educational displays, and newsletters were the primary methods used in reaching food stamp recipients/applicants. Program documentation reflects that 14,190 individual lessons were taught statewide with dietary quality and food safety being the primary core elements covered. Key messages focused on healthy eating and physical activity practices, healthy snacks, serving sizes and portion control, label reading, low-fat cooking techniques, how to plan and prepare healthy, low-cost meals, proper hand washing, and food safety practices.

Extension Program Results and Accomplishments

Output Indicators:

Contacts numbered 418,384 with 354,333 being direct contacts and 64,051 as indirect contacts through educational displays and newsletters. Of these contacts, 69,854 were direct unduplicated and 14,707 were indirect unduplicated contacts. Total contacts increase 101% over FY03. Unduplicated contacts increased by 73%.

Through reports by Extension agents, food stamp applicants/recipients contacts numbered 7,405. Additional food stamp recipients/applicants were reached through nutrition education delivered in approved waived sites where 50% or more of the population is at or below 185% of poverty. Reported contacts reached through approved waivers included 260 through census tracts, 2,732 via commodity sites, 1,073 via sites with a director's documentation of eligibility, 18,021 via DHS office, 4,030 via Head Start, 389,557 via schools where 50% or more of students receive free or reduced lunches, and 2,711 via WIC units. Where possible, food stamp recipients/applicants are documented through self report on sign-in sheets, agency records, or by comparing participant names to a list of food stamp recipients provided by the state agency. This information is not always available or obtainable, particularly for youth participants. Therefore, the number of food stamp recipients/applicants contacts reported is under estimated as stated.

In addition, FCS agents in eight counties delivered nutrition education through The Families First – Nutrition Education and Wellness System (FF-NEWS) administered through the University of Arkansas at Pine Bluff. Contacts with food stamp recipients/applicants and other low-income individuals numbered 32,139 during the program year. Of these, 26,007 contacts were in schools, 5,027 were with food stamp recipients/applicants through DHS offices, 580 were through Head Start, and 522 were with WIC participants.

Outcome Indicators

- 29,859 Youth learned something new about their diet based on the Food Guide Pyramid.
- 27,457 Youth might change eating habits based on the Food Guide Pyramid.
- 20,939 Youth learned something new about eating more fruits.
- 19,635 Youth might change eating habits by eating more fruits.
- 19,692 Youth learned something new about eating more vegetables..
- 17,635 Youth might change eating habits by eating more vegetables.
- 16,451 Youth learned something new about eating more foods with whole grains.
- 12,742 Youth might change eating habits by eating more foods with whole grains.
- 12,725 Youth learned something new about eating fewer high fat foods.
- 11,530 Youth might change eating habits by eating fewer high fat foods.
- 16,876 Youth learned something new about eating more calcium-rich foods.
- 14,999 Youth might change eating habits by eating more calcium-rich foods.
- 12,316 Youth learned something new about eating fewer high sugar foods.
- 10,291 Youth might change eating habits by eating fewer high sugar foods.
- 16,630 Youth learned something new about trying new foods.
- 14,838 Youth might change eating habits by trying new foods.
- 12,219 Youth learned something new about eating breakfast every morning.
- 10,234 Youth might change eating habits by eating breakfast every morning.
- 20,637 Youth learned something new about increasing physical activities.
- 16,257 Youth might change eating habits by increasing physical activities.
- 12,483 Youth learned something new about practicing good hand-washing techniques.
- 10,449 Youth might change habits by practicing good hand-washing techniques.
- 9,755 Youth learned something new about practicing food safety techniques.
- 7,871 Youth might change habits by practicing better food safety techniques.

Dietary Quality

- 682 Increased the use of the Food Guide Pyramid to plan what they eat.
- 687 Increased their fruit and vegetable consumption.
- 687 Increased their level of physical activity.
- 470 Increased consumption of whole-grain products.
- 494 Increased consumption of calcium-rich foods.
- 696 Decreased consumption of fat/saturated fat in their diet.
- 658 Decreased consumption of high-sugar foods and beverages.
- 764 Improved portion sizes.
- 784 Increased use of the information on food labels to make healthier choices.

Food Safety

- 71 Increased the number of times they kept food at safe temperatures.
- 71 Increased the number of times they thaw meat using recommended methods.
- 1,338 Increased the number of times they practiced good personal hygiene.
- 2,066 Increased the number of times they followed proper hand washing procedures.
- 121 Increased the number of times they cooked foods adequately.
- 121 Increased the number of times they avoid foods from unsafe sources.

Food Resource Management/Shopping Behavior

- 677 Increased knowledge/skills about preparing a food budget.
- 99 Increased knowledge/skills about planning meals ahead of time.
- 155 Increased knowledge/skills about comparing prices.
- 695 Increased knowledge/skills about making a grocery list.
- 491 Increased knowledge/skills about reading food labels.

- 202 Increased knowledge/skills about making food from basic ingredients.
- 496 Increased the number of times they read the food label.

Partnerships

- 157 Number of new collaborating partnerships.
- 626 Number of meetings with group collaborations.

In 2004 a teacher survey was mailed to a total population of 641 participating teachers statewide. The goal of the survey was to engage teachers in the evaluation of the program, to inform the program about teacher attitudes, and to assess what teachers need from us as partners. CES received 255 responses for an overall response rate of 39.78%. Data was sorted and analyzed to assess county, district, and statewide needs and program status.

Almost a fourth of participating teachers had never incorporated nutrition education into their classroom prior to this FY04 FSNE program. On a scale of one to ten, the statewide mean score on how teachers rated the value of the FSNE program to their students was 8.59. Approximately 71% of the teachers surveyed said that the program had motivated them to eat healthier and be more physically active.

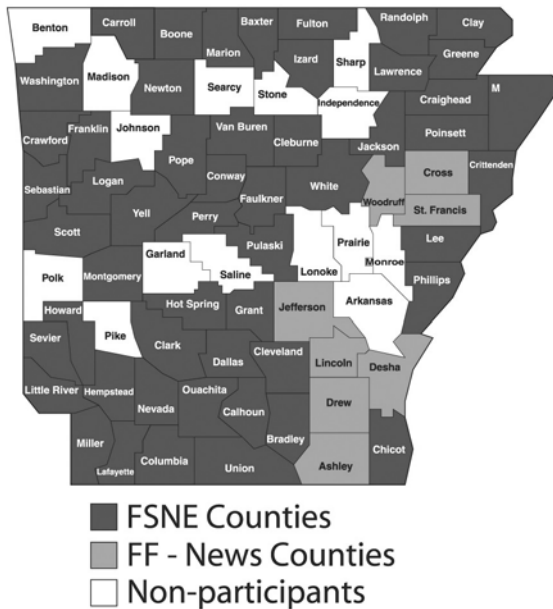
Source of Funds

The Food Stamp Nutrition Education (FSNE) program is a reimbursable, federally funded program. The University of Arkansas, Division of Agriculture contracts with the Department of Human Services (DHS) to provide nutrition education for the target audience.

Scope of Impact

Dissemination – Counties are invited to prepare and submit a plan proposal including goals and objectives for reaching the target audience and a proposed budget annually. Plans are reviewed at the state level and then compiled and submitted to the Department of Human Services for review and approval by July 15. The plan is then sent to the regional Food Nutrition Service (FNS) office for final approval. A statewide training is held in the spring to provide counties with program requirements, training on curriculum resources, and an overview of the plan proposal process. Additional training is held in the fall to provide training on evaluation and reporting. Program guidelines, resources, forms and other supporting documents are posted on the FSNE web site located on the Extension Intranet under the Family and Consumer Science Department page.

Scope of Program – Forty-nine counties in Arkansas participated in FSNE during FY 2004 including Baxter, Boone, Bradley, Calhoun, Carroll, Chicot, Clark, Clay, Cleburne, Cleveland, Columbia, Conway, Craighead, Crawford, Crittenden, Faulkner, Franklin, Fulton, Grant, Greene, Hempstead, Hot Spring, Howard, IZard, Jackson, Lafayette, Lawrence, Lee, Little River, Logan, Marion, Miller, Mississippi, Montgomery, Nevada, Newton, Perry, Poinsett, Pope, Pulaski, Randolph, Scott, Sebastian, Sevier, Union, Van Buren, Washington, White, and Yell.



Programs of Excellence

Fulton County Extension Helps Schools Deal With BMI

Twenty-two percent of children in Salem Elementary School are overweight. What is being done to address this problem?

Fulton County Extension Agent MaLinda Coffman is teaching nutrition education to students through the Food Stamp Nutrition Education (FSNE) program. Twenty-five classes were taught to over 80 students during the 2003-04 school year. Children learned a variety of things including how much fat is in a fast food hamburger, what counts as a serving, and proper hand-washing techniques. Each nutrition lesson contained a hands-on activity to help the children have fun while learning healthy lifestyle habits. The students and teachers enjoyed learning about healthy foods. Some comments were, "The students' parents are buying more fruits and vegetables." "Students are talking about what is being served in the lunchroom and what food group each food belongs to." "Students comment when someone does not practice good hand-washing techniques."

As a result of FSNE program:

88% of participants increased knowledge of the Food Guide Pyramid.

90% of participants indicated they would change eating habits.

82% of participants indicated they would eat fewer high fat foods.

65% of participants indicated they would eat more fruit.

65% of participants indicated they would eat more vegetables.

58% of participants indicated they would eat less sugar containing foods.

Nutrition Program Fights Childhood Obesity

The problem of childhood obesity is reaching new and alarming figures. To help combat the obesity problem in Washington County, students from schools where 50% or more of the students are on free or reduced lunches were targeted to receive nutrition education. Seventeen schools were identified. Washington County's population is 162,023 of which 14.6% of adults and 19.1% of children are living in households with incomes at or below the poverty level. There were 13,932 persons enrolled in the Food Stamp Program of which 6,933 were school age children. These children are located in the Fayetteville, Springdale, Lincoln, and Winslow school districts. Through a USDA program administrated by the Arkansas Department of Human Services, five program assistants were hired to work in these schools. They taught nutrition to kindergarten through high school classes, reaching 39,119 students. Of this number the racial composition was 61% white, 2% black, 7% Asian, 28% Hispanic, and 1% Native American. This program impacted all families throughout the county. The five program assistants spent over 396 hours in the classrooms. All of the 39,119 students indicated they had learned something new about nutrition, diet, and exercise. Over 50% have changed a behavior and are eating more fruits and vegetables.

An additional eight sessions of nutrition were taught to the Department of Humans Services (DHS) foster children during the summer. Twenty high school age students

participated in the program and studied nutrition. The foster children all indicated that they had learned a new skill and 100% increased their knowledge of nutrition and were practicing some of the cooking techniques taught, which resulted in better nutrition for them.

These students have been able to learn and put into practice better nutrition by eating more fruits and vegetables, following the Food Guide Pyramid, and becoming healthier individuals. Their families have learned along with the students and are practicing better eating habits at home. A backpack program was developed which identified hungry children and food was sent home weekly with them to combat hunger in our county.

Program Response: Healthy Weight for Arkansans

Contact: Dr. Rosemary Rodibaugh, Extension Nutrition Specialist, 501-671-2111, Family and Consumer Sciences, rodibaugh@uaex.edu

Situation

According to the U.S. Department of Health and Human Services, unhealthy eating habits, coupled with physical inactivity, are now the nation's second leading cause of death. It has been estimated that 14% of deaths can be attributed to poor eating and lack of physical activity. Lifestyle factors, such as high-fat diets and physical inactivity increase the risk of chronic diseases such as heart disease, stroke, certain cancers, and diabetes.

Risk factors for Arkansans include:

- Four of the ten leading causes of death in Arkansas are related to diet (heart disease, cancer, stroke, and diabetes).
- Cardiovascular disease is the leading cause of death in Arkansas.
- High blood pressure affects more than one-third of adult Arkansans.
- The adult diabetes rate in Arkansas is 7.9 percent – one of the highest in the U.S. Approximately 156,000 Arkansans have been diagnosed with diabetes and an estimated additional 78,000 have the disease but are unaware of their condition.
- Arkansas has one of the highest obesity rates with 61% of adults being either overweight or obese.
- Childhood obesity in Arkansas has reached epidemic proportions, where 14% of children 0-5 years are at risk for becoming overweight and nearly 12% are considered overweight. Among school-age children in grades K-12, 17% are at risk for becoming overweight and 21% are overweight.
- Annual medical expenditures related to obesity in Arkansas are \$663 million. More than half of these dollars come from state and federal government sources.
- Nearly eight out of 10 Arkansans report they are not consuming the recommended five servings of fruits and vegetables a day.
- Almost 79% of adult Arkansans are at risk for health problems related to lack of physical activity.

Through research and consumer education on nutrition and the preparation and selection of more nutritious foods, Cooperative Extension faculty and staff enable Arkansans to make health-promoting choices.

Stakeholder Input

County Extension Councils identify specific nutrition issues and programs that should be emphasized in each of their respective counties. The district administrative staff and

agents likewise provide consumer feedback to specialists regarding nutrition issues and needs for long-range educational programming. Teachers and child care providers are surveyed to determine nutrition education needs of children with whom they work. Other input that helps shape our program comes from statewide councils and committees addressing chronic health issues including the Cardiovascular Health Program, Diabetes Control Program, Child Health Advisory Committee, Arkansas Nutrition Advocacy Council, and Arkansas Action for Healthy Kids. In 2004, BMI data was collected on more than 90% of school children in grades K-12. Data revealed that that a much higher percentage of children than expected (38%) are at risk for becoming overweight or are already overweight.

Overview

Obesity and being overweight increases the risk of many chronic diseases and is increasing among Arkansans of all ages. Approximately 61% of Arkansas' adults are overweight or obese. Additionally, 26% of children under five and 38% of school-age children are at risk for becoming overweight or are overweight. There is strong evidence that weight loss in overweight and obese individuals reduces risk factors for cardiovascular diseases and diabetes by lowering blood pressure, blood lipids, and blood glucose levels. In FY04, the emphasis of the human nutrition program was on helping Arkansans achieve or maintain a healthy weight. Programs reached Arkansans from pre-K through older adults through training Extension agents, child care providers, teachers, and parents about the child obesity crisis and ways they can provide healthy food, physical activity, and nutrition education to children in their care. School-based nutrition education programs for children and adolescents and delivery of a 15-week weight management program for adults were two statewide Extension initiatives.

Extension Program Results and Accomplishments

Output Indicators

- 1,194 Educational sessions were related to healthy weight.
- 36,925 Participants attended programs related to healthy weight.
- 19 School/after school programs were related to healthy weight (non-FSNE programs).
- 1,553 Non-FSNE participants reached through school/after school programs related to healthy weight.
- 23 Newsletters included information on healthy weight.
- 3,773 People received newsletters with healthy weight information.
- 359 Print media articles related to healthy weight.

- 302 Radio spots related to healthy weight.
- 46 Television spots related to healthy weight.

Outcome Indicators

- 88% Increase in the number of participants who correctly identified standard servings of foods from each of the Pyramid food groups following participation in and Extension program.
- 88% Participants who reported they altered their behavior to follow standard serving sizes of one or more of the Pyramid food groups.
- 13% Decrease in the number of participants who eat <5 servings of fruits and/or vegetables daily.
- 22% Decrease in the number of participants who eat ≥ 3 high-fat foods daily.
- 414 Participants in Healthy Weight program.
- 293 Participants finished the Healthy Weight program.
- 2,426 Total pounds lost by program graduates.
- 21,075 Miles walked by program graduates.
- 74% Graduates who improved blood pressure.
- 76% Graduates who improved blood cholesterol.
- 56% Graduates who improved blood glucose.

Source of Funds

Smith-Lever

Scope of Impact

Dissemination – Statewide availability. Materials are provided to counties in a number of ways including curricula (purchased and internal), leader’s guides, web sites, e-mail listserv, brochures, fact sheets, and newsletters.

Scope of Program – 64 FCS agents in 59 counties reported conducting programs on healthy weight in FY04: Arkansas, Ashley, Benton, Boone, Bradley, Calhoun, Carroll, Chico, Clark, Cleburne, Cleveland, Columbia, Conway, Craighead, Crawford,

Crittenden, Cross, Dallas, Desha, Drew, Faulkner, Franklin, Fulton, Garland, Grant, Greene, Hot Spring, Howard, Independence, Jefferson, Johnson, Lafayette, Lee, Little River, Logan, Madison, Marion, Miller, Mississippi, Monroe, Nevada, Newton, Perry, Phillips, Poinsett, Polk, Pope, Prairie, Pulaski, Randolph, Saline, Scott, Searcy, Sevier, Union, Van Buren, Washington, White, (Ozark = 18, Delta = 18 and Ouachita = 23).

Programs of Excellence

Reshape Yourself - State Specific

Obesity is a growing health problem in Arkansas where over half of adults are overweight. Being overweight or obese is a risk factor for several chronic diseases such as heart disease, stroke, certain types of cancer, and diabetes. Reshape Yourself is a 15-week weight management program focusing on healthy eating and regular physical activity that helps Arkansans achieve and maintain a healthier weight.

“I have really enjoyed this program. It has helped me more than anything else I have ever done to lose weight. I have lost 22 1/2 pounds. I love it when my family compliments me on my weight loss. I am thrilled that my cholesterol has gone down 26 points and my heart rate went from the 90's to the 60's. I can now walk with my husband and we enjoy that. I think the way I cook will also benefit my husband. I hope you will have this program next year.” – Ashley County participant

“I am well-pleased with my success in this program. I came within 1/2 pound of meeting my goal. I lowered my cholesterol, my body fat, my blood glucose, and I lost 18 inches. I not only look better, but I feel better. I walk three miles every morning before I go to work and I feel so much better all day long. My goal is to stay on this program for a lifetime.” – Ashley County participant

"I was able to walk the streets of a beautiful country and see many works of art that I would not have been able to see had I not lost weight on the Reshape Yourself program." – Drew County participant who lost 100 pounds over two years and was able to go on a "dream vacation" with her daughter.

“In the last three years I have had thyroid surgery, a hysterectomy, and been diagnosed with depression. I have tried several diets and have had short-term success. In the six months prior to attending this program, I was having extreme difficulty motivating myself to eat properly or to exercise. It has still taken me a while, but I am eating much healthier and exercising four to six days each week, sometimes twice a day. My biggest improvement has been a dramatic increase in energy. I have lost five pounds, and can see a noticeable difference in toning. My clothes are starting to fit better. I am really beginning to get excited about the lifestyle changes I am making. The more knowledge I gain, the more committed I am to these changes. This is a great course, and I would recommend it to anyone!” – Pulaski County participant

"I am very proud of the 21 pounds I lost. I love it when people ask me if I have lost weight. I recommend this program for anyone that tells me they are on a diet. I am also very proud of my husband for losing 42 pounds. I started this program with my husband because he had health problems and needed to lose weight. Little did I know how much I would benefit from the classes." – Cleveland County participant

Positive feelings like these were experienced all over Arkansas. Seventeen counties reported that 293 graduates in 18 classes lost 2,426 pounds by changing their eating habits and walking 20,775 miles. Of graduates who checked blood pressure, cholesterol and glucose before and after the 15-week course, 74% reported improvement in blood pressure, 76% reported improvement in cholesterol and 56% showed improvement in blood glucose levels.

Locations – Counties conducting Reshape Yourself in FY04: Arkansas, Ashley, Baxter, Cleburne, Cleveland, Columbia, Crawford, Crittenden, Drew, Howard, Jefferson, Marion, Monroe, Newton, Perry, Prairie, Pulaski.

Contact – Dr. Rosemary Rodibaugh, 501-671-2111, Family and Consumer Sciences, rrodibaugh@uaex.edu

Delta H.O.P.E Tri-State Obesity Initiative – Multi-State

The Delta H.O.P.E (Healthy Options for People through Extension) is a multistate effort involving faculty from University of Arkansas, Mississippi State University and Louisiana State University Extension Services. Arkansas implemented the TAKE 10!/OrganWise Guys curriculum in second grade classrooms in six schools in the Delta region. TAKE 10! integrates physical activity and nutrition education into core subject areas 10 minutes at a time.

- 25 teachers were trained to deliver the program.
- Teachers conducted the /TAKE 10!/OrganWise Guys activities and average of 3.7 times a week.
- 403 second graders learned the four basic rules to become members of the OrganWise Guys Club: Eat low-fat; Eat high-fiber; Drink lots of water; Exercise.
- 76% of teachers said they would continue conducting TAKE 10!/OrganWise Guys.
- 64% of teachers said they would recommend TAKE 10!/OrganWise Guys to other teachers.
- 88% of teachers said their students enjoyed the TAKE 10!/OrganWise Guys activities.
- 72% of teachers said their students requested TAKE 10! on days when they didn't do it.

What teachers said about the program:

- "I have really enjoyed this program and will continue to use it. When the state

- Department visited us, they were impressed with the program.”
- “The best time-saver is already having all the activities matched to the Arkansas frameworks. That is a BIG plus!”
 - “I think this is a great program. I just haven’t had the classroom time to do it justice.”
 - “I’m doing a “Take 6.” I found it easier to have my students do some kind of movement during our singing time than try to do it another time.”

The project will expand to additional grades (K-5) in currently participating schools in school year 2004 -2005.

Source of Funds – Smith-Lever and the Kellogg Foundation.

Locations – Three counties Ashley, Drew, and Woodruff.

Contact – Dr. Rosemary Rodibaugh, 501-671-2111, Family and Consumer Sciences, rrodibaugh@uaex.edu

Goal 4 – Greater harmony between agriculture and the environment.

Integrated pest management is an important aspect of agriculture in Arkansas. Pest management is an essential part of cotton production in the state in helping producers farm more efficiently and reduce reliance on pesticides. Stink bugs and the plant bug complexes have emerged as primary pests of cotton as a result of the use of transgenic cotton and boll weevil eradications which have reduced insecticide use that previously controlled these pests. The addition of herbicide-tolerant crops has increased weed management options, requiring increased education on weed control. Extension information delivery systems educate growers, county agents, consultants, and industry representatives on transgenic cotton, cultural practices, nematode management strategies, aphid fungus, moth trapping, weeds, diseases and utilization of pesticides. Another crop, soybeans, is an intensively managed crop requiring timely irrigation, fertilizer and pesticide applications. An Extension Soybean IPM Education Program was initiated in 1999 as an effort to teach producers how to better manage soybeans using pest management methods that improve production efficiency.

Arkansas is the largest producer of rice in the United States. Weeds, insects and diseases in the rice crop are more efficiently controlled with pesticides if scouting and decision thresholds are used. The Rice IPM Education Program was initiated in 1998 to encourage adoption of integrated pest management principles in Arkansas rice production. To achieve its goals, the program provides support to county Extension agents through a grant system, and all major rice counties have consistently participated. Several demonstrations were utilized to address current pest management problems that included disease monitoring plots and stink bug management demonstrations.

Agricultural production outside of the traditional row crop systems of the Delta in Arkansas is very diverse. These agricultural systems have a unique complex of pest problems. Pest problems range from several species of flies that impact dairy production in Arkansas to grape producers dealing with grape berry moths, grape scale and grape root borer. Retailers will not buy grapes that have insect damage and, therefore, it is essential for producers to maintain control of pests. Pasture weed management education is an important aspect of livestock production since nutrition of livestock is directly related to the quality of hay and forage.

Agricultural chemicals, pesticides and plant nutrients, comprise a major portion of the dollars spent by producers of all Arkansas crops. The primary emphasis on aircraft precision agriculture programs makes chemical applications more efficacious and environmentally sound. Over 1,000 aircraft pattern analyses were performed on Arkansas aircraft for pesticide applications at 14 agricultural aviation workshops conducted by Extension. Extension has also provided many additional government agencies with guidance and assistance concerning chemical application problems. Federal and state

laws require education and training of applicators of restricted use pesticides. Private and commercial applicators must be periodically recertified by attending educational programs on pesticide safety, integrated pest management, endangered species protection, groundwater protection, the Worker Protection Standard, and other topics. Training programs are a part of county programs, and over 7,100 individuals were trained in 2004.

The scope of Urban Integrated Pest Management in Arkansas is very diverse, involving insect pests that can directly impact all citizens of the state. West Nile Virus is a mosquito-borne arbo-virus that was first recognized in the western hemisphere during the summer of 1999. An Extension program stressing awareness of West Nile Virus was launched in conjunction with other state agencies that made Arkansas citizens knowledgeable about this threat. The Urban Integrated Pest Management program was developed to focus programs toward protecting the health and property of the citizens of Arkansas. These programs use innovative methods to educate, detect, and protect Arkansans from threatening pest species. Fire ant management is also a critical aspect of pest management because of the serious health threat they present. Extension activities in Arkansas target the fire ant with some of the best educational aids in the nation including materials for adult and youth audiences.

Water conservation is a major emphasis of Arkansas Extension's educational efforts. The Irrigation Scheduling Program has been rapidly adopted by farmers to conserve water during irrigation while improving yields at the same time. Five other states are using the program. The Multiple Inlet Irrigation System has gained major acceptance by farmers. It has demonstrated potential average water and energy savings of 25 percent and an average labor savings of approximately 30 percent.

The forest products industry in Arkansas contributes millions of dollars annually in salaries to employees, in value-added dollars, and stumpage prices to private landowners. Private non-industrial forest landowners own more than half of the state's 18,778,660 acres of forestland. Many landowners are unfamiliar with sustainable forest management practices, timber marketing, reforestation incentives, and other vital information. Oak sustainability after several years of drought, overcrowding, poor soils, inadequate management, insect damage, and declining vigor are severely affecting the oak forests. Extension is addressing the most critical information needs and issues that include forest management and natural resource education for county agents, other professionals, and a continuing education program. The forestry best management practice program is a critical program to protect and conserve water quality. Urban tree care is also an important issue for Extension community and urban landscape education programs, especially with Arkansas weather that often involves ice storms and related tree injury. Arkansas has partnered with Louisiana State University and Mississippi State University to conduct the Master Farmer program, an environmental education program for farmers.

Wildlife management is an important aspect of our natural resources since Arkansas is home to abundant wildlife. Many Arkansans are interested in wildlife recreation and

wildlife enterprises. Wildlife enterprises are sometimes overlooked as an alternative for agricultural producers. Yet when economic conditions are severe and profit margins slim, a wildlife enterprise might make the difference between a producer's loss or profit. A combination of abundant wildlife and public interest in wildlife has created a large demand for Extension education programs and information about wildlife habitat enhancement, nuisance control, and wildlife enterprises.

Arkansas generates approximately four million tons of solid waste annually, over a ton per person each year. The state has a limited number of disposal sites or landfills. Some areas of the state do not have comprehensive solid waste management collection programs. Improper disposal of solid waste is a health and safety problem and a detriment to economic development. Also, Arkansas livestock producers with confined animal feeding operations that use liquid manure handling systems 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. Extension has developed programs to address waste management and recycling that train our clientele on environmentally safe methods to dispose of waste.

Total FTEs
84.39

Total Budgetary Amount

\$3,637,913.32

<p>KEY THEME: AGRICULTURAL WASTE MANAGEMENT</p>

Program Response:
Animal Waste Management

Contact: Karl VanDevender, Extension Engineer, 501-671-2244, Biological and Agricultural Engineering

Situation

Arkansas has 32,000 dairy cattle on approximately 250 farms and over 300,000 head of swine placed at one time on about 360 farms. Annual broiler production is 1.2 billion birds. Turkey production is 30 million birds annually. There are 1.9 million head of beef

cattle on Arkansas farms. Annual Arkansas farm gate income from livestock and poultry is \$3 billion before support services, industry or further processing are added.

A 1997 study indicated that animal production in Arkansas generates approximately 3.4 billion tons of manure on a dry weight basis each year. Annually the beef cattle, poultry, swine and dairy industries generate about 1.8, 1.3, 0.1 and 0.2 billion tons of manure, respectively.

Stakeholder Input

Personal communications with producers, livestock and poultry integrators, governmental agencies and county agents indicate that educational efforts in manure and mortality management are crucial to address environmental concerns. This input is used to shape and direct educational programs.

Overview

Since 1993, all Arkansas producers with confined animal feeding operations that use 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.

In contrast, Arkansas livestock and poultry producers with dry manure systems have been encouraged by state and federal agencies to voluntarily comply with appropriate manure management BMPs and to attend Extension's environmental education programs. A special effort is made by state and federal agencies and poultry integrators to encourage poultry producers to develop and follow a nutrient management plan for their farms.

However, the regulatory requirements are in the process of changing with the implementation of revised EPA Concentrated Animal Feeding Operation regulations and new state laws that regulate the utilization of nutrients, both manure and commercial fertilizers, in certain sensitive watersheds.

Extension Program Results and Accomplishments

Output Indicators

- 1,325 Producers, industry, or agency personnel attended educational programs.
- 28 Educational meetings, field days and/or demonstrations held to educate clientele on liquid and dry animal waste management.
- 1,042 Individual contacts were made via site visits, phone, mail, or e-mail opportunities.

1,042 Received information by the 5 newsletters generated and released,

Outcome Indicators

- Approximately 700 individuals representing 500 farms attended 14 annual liquid animal waste refresher trainings hosted by Extension and required by state regulations. Most of these individuals were owner/operators of swine, dairy and poultry farms with liquid waste permits. However, there were also agency personnel attending.
- Over 1,000 manure samples analyzed by the University of Arkansas Agricultural Diagnostic Laboratory. Most of these analyses were performed on manure samples submitted by Arkansas livestock and poultry producers. Manure sampling and planning is one of the main targeted outcomes of Extension's educational effort.

Source of Funds

Miscellaneous EPA 319 grants combined with CES funding.

Scope of Impact

Dissemination – Statewide availability of program to interested counties. Waste management information/publications available via county Extension offices and through UAEX web site.

Scope of Program – Producers living in the western two-thirds of the state had the opportunity to receive educational material. Producers from 476 permitted liquid waste systems received their state mandated annual training. The University of Arkansas processed 1,000 manure samples to provide producers information necessary to better manage their manure.

Program Response: Impact of Environmental Training for the Livestock Industry

Contact: Dr. Susan Watkins, Extension Poultry Specialist, 479-575-7902,
swatkin@uark.edu

Situation

Concentrated poultry production has been targeted as a culprit in the degradation of water quality in many areas of the state. The goal of the Environmental Education for the Arkansas Livestock Industry program was to increase the understanding of poultry producers on environmental issues and how their production practices could influence water quality. By increasing the understanding of poultry producers of how nutrients should be managed after the nutrients leave the production barns, producers can reduce the risk of nutrient or phosphorus runoff to rivers and streams. Also, by educating producers on best management practices that can be used in their operation, they can better utilize their resources to enhance overall farm profitability. Providing information on new environmental laws also helps producers understand and, therefore, comply with the regulations.

Stakeholder Input

Poultry companies and producers know that they must be good environmental stewards in order to maintain a viable industry in Arkansas. Therefore, they are interested in understanding what the environmental laws are and what they need to do to be good stewards of the environment.

Overview

Environmental education has been provided through programs and newsletters. In addition, a class was offered through the University of Arkansas Center of Excellence for Poultry Science for industry personnel and water quality technicians who needed a rounded environmental education.

Extension Program Results and Accomplishments

Output Indicators

- 8 Fact sheets, popular press or newsletter articles.
- 12 Poultry producers' meetings.

58 Farm visits and one-on-one consultations.

Outcome Indicators

2,559 Poultry producers were educated on good environmental practices.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – This program is available to any poultry producer in the state.

Scope of Program – This program was presented in Arkansas.

KEY THEME: FOREST RESOURCE MANAGEMENT
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Program Response: Forest Landowner Education

Contact: Tamara Walkingstick, Ph.D., Extension Specialist-Forestry, Environment & Natural Resources, 501-671-2346, twalkingstick@uaex.edu; Caroll Guffey, Extension Instructor, 870-460-1549, guffey@uamont.edu; Kyle Cunningham, Extension Instructor, 501-671-2145, kcunningham@uaex.edu; Chris Stuhlinger, University System Forester, 870-460-1749, stuhlinger@uamont.edu.

Situation

The forest products industry in Arkansas is one of the largest in the state and contributes millions of dollars annually in salaries to employees, in value-added dollars, and stumpage prices to private landowners. More than half of the state's 18,778,660 acres of forestland is owned by private non-industrial forest landowners. This important landowner group is comprised of farmers, ranchers, homeowners, teachers, factory workers, professionals, and retirees. Cattle ranchers and row crop producers are becoming more interested in forest management as a means of realizing additional income, especially in light of declining prices. However, many of

these landowners are unfamiliar with sustainable forest management practices, timber marketing, reforestation incentives, and other vital information.

Forest sustainability is an increasing concern for the public and among stakeholders. Nationwide, forests face severe problems from insects and diseases, hazardous fuel loadings, and inadequate management. In addition, the interrelationship between forest management and biodiversity and other environmental considerations is becoming increasingly important. Non-industrial private forest landowners, the largest if not most important forest landowner group, are often unaware of the potential impact to water and other natural resources from forest management practices. Many of these same forest landowners either lack the resources or the desire to regenerate their forest land after harvest. Forest management practices can achieve economic and sustainability goals, but it requires education and awareness.

The most critical information needs and issues include:

Forest Management:

- More than 60% of the annual timber harvest comes from NIPF lands, and this will likely rise as major corporations divest in their forestland; e.g., several large forest product industries sold large holdings in 2004. The trend will most likely continue. Some industry observers suggest that most large timber companies will divest themselves entirely of the forest holdings and rely exclusively upon stumpage from private forest landowners.
- Many landowners, especially in north Arkansas and the Delta, have limited knowledge about timber marketing, harvesting, planning, and reforestation.
- Demand for forest products continues to rise. This demand will impact private forestlands. Forest landowners, therefore, need to be educated about the benefits and costs of this increased demand for their forest products.
- Landowner understanding and awareness of forest management practices designed to protect water quality (Best Management Practices) remains limited. Preliminary results from a landowner survey suggest that less than 25% have ever heard of forestry BMPs.

Stakeholder Input

Stakeholder input comes from several different sources including County Extension Councils, the Arkansas Forestry Association Landowner Education Committee, the Ozark Foothills Forest Landowner Education Committee, the Forestry Division of the Arkansas Farm Bureau, the Continuing Education Advisory Board, the Arkansas Forest Resources Center, the U.S. Forest Service, the Ozark Woodlands Landowner

Association, Master Tree program attendees, and the Master Tree Farmer steering committee. In 2002, a research project into the education needs of Arkansas Delta African-American forest landowners was conducted and their input documented.

Overview

Forest landowner education is facilitated through several different types of programs at the county, state, and regional level. County agents develop and host forest landowner meetings, host Master Tree Farmer series, collaborate with the Arkansas Forestry Association to co-host workshops, or participate in a multi-county project developing and implementing forest landowner education. Demonstration areas and field days are designed with the University System experiment stations and collaborators to educate landowners and professionals. Topics include basic forest management, marketing, best management practices, stand evaluation, and alternative forest products including pine straw and shiitake mushrooms.

Master Tree Farmer Series. The Southern U.S. Master Tree Farmer program is a satellite broadcast short course that covers a wide range of forest management topics including planning, wildlife habitat, forest finance, and marketing. The course is sponsored by Clemson University and the Extension System, Southern Region, USDA-CSREES, the Southern Group of State Foresters, the American Tree Farm System, American Forest & Paper Association, state forestry associations, and participating industry representatives. The Master Tree Farmer course in 2004 was an introductory forest management course. Eight counties were involved in planning for the 2004 course.

Ozark Foothills RC&D Landowner Education Initiatives. The Ozark Foothills Resource Conservation & Development (RC&D) council, working with the UA Cooperative Extension Service, the Arkansas Forestry Commission, the Natural Resource Conservation Service, the Arkansas Game and Fish Commission, and other state and local agency partners, developed a forest landowner education program to meet the educational needs of forest landowners in the 10 county RC&D council area. The overall goal of the project is to encourage productive and sustainable private forest management while maintaining and/or enhancing the economic viability of the forest products industry in the Ozark Foothills council area. Newsletters, workshops, fact sheets, presentations, and developing county level program committees are all components of the 3-year project. One innovative aspect of the project is the support given to the Arkansas Forestry Commission's Stewardship program.

Multi-County Forestry & Wildlife Mini-Grants. Eight county Extension offices received funding through the Arkansas Forest Resource Center to help expand their forest and wildlife educational efforts. Funding was used to purchase materials, tools, and resources for demonstration and research projects, or was used to sponsor landowner

education workshops and field days. In many cases, this work would not have been possible without the support of the extra funding.

Extension Program Results and Accomplishments

Output Indicators

- 15 Number of educational meetings held with forestry industry representatives, State and federal agency personnel, Arkansas Forestry Association, Arkansas Forest Resource Center and UA Cooperative Extension faculty to identify forest landowner education issues and plan education programs.
- 51 Number of landowner education meetings conducted.
- 8,832 Number of landowners attending workshops and educational meetings.
- 13 Number of demonstrations conducted.
- 438 Number of individuals attending demonstrations.
- 25 Forestry field days.
- 653 Number of individuals attending field days.
- 20,000 Number of landowners identified as part of an 11-county education initiative in partnership with Ozark RC&D council receiving quarterly newsletter.
- 11,631 Number of clientele receiving newsletters about forestry and forest management.
- 100 Number of county agents, state and federal agents, and other natural resource professional receiving the Arkansas Timber Market Report.
- 5 Number of radio stations carrying quarterly Arkansas Timber Market Update.

Outcome Indicators

- 100 Number of landowners indicating an increased knowledge of forest management for wildlife.
- 90 Number of landowners receiving certificates for completing a 7-week short-course.
- \$75,000 Dollars allocated to augment the Arkansas Forestry Commission's Forest Stewardship Program as part of landowner education project with the Ozark RC&D council.

390 Number of landowner requests for Stewardship plans through the Ozark Foothills Forest Landowner Education Program.

Source of Funds

Smith-Lever 3b & 3c, USDA Forest Service, CSREES, and Ozark Foothills Forest Landowner Education Project (OFFLEP). RREA, and Arkansas Forest Resources Center.

Scope of Impact

Dissemination – Statewide distribution of timber price information to all counties and partner agencies. Timber valuation information available on-line and via fact sheets and handouts. The 7-week Master Tree Farmer short course broadcast via satellite to 7 different sites across the state. Weekly radio program broadcast to 5 stations through the Arkansas Ag. Network.

Counties involved in forest resource education:

- Counties in the Ozark Foothills Forest Landowner Education Project – Cleburne, Fulton, Independence, Izard, Jackson, Lawrence, Randolph, Sharp, Stone, White, Van Buren.
- Other counties with forest resource management education programs – Hempstead, De Queen, Drew, Bradley, Montgomery, Nevada, Washington, Polk, Pope, Cleveland, Madison, Newton, and Union.

The Master Tree Farmer programs covers the following states: Alabama, Georgia, Mississippi, Tennessee, Texas, Oklahoma, North Carolina, South Carolina, Florida, Kentucky, Arkansas, and Missouri.

Program Response: Urban Forest Management

Contact: Tamara Walkingstick, Ph.D., Extension Specialist - Forestry, 501-671-2346, Carroll Guffey, Extension Instructor - Forestry, UA-Monticello, 870-460-1549, Environmental and Natural Resources

Situation

Forestry entails more than timber stand management. Forestry also includes managing trees in urban and community settings. Insects, disease, natural disasters, and urban sprawl all impact trees in community settings. Understanding the importance of community trees becomes especially important as economic growth expands throughout the state. In addition, urban-wildland interface issues are also emerging as more people

move to the traditionally forested and agricultural areas outside of larger cities. The most significant needs include:

Response to Natural Disasters: Natural disasters are common in Arkansas and include ice and wind storms, tornadoes and wildfire. Winter storms, tornadoes, wildfire, and poor forest health destroy or damage thousands of urban trees a year. For example, the December 2000 ice storm destroyed or damaged over 68,000 urban trees that cost over \$83,000,000 to remove and to replace. Damage from these natural disasters is costly. Through appropriate information and education, city and county officials, homeowners, and professionals can minimize potential damage to their urban trees.

The past several years of drought and the debris from the ice storms potentially create a tremendous fire hazard, especially for those homes built in the urban-rural interface. Although interface fires do not occur at levels seen in the West, they are becoming an issue in Arkansas, at least to fire protection professionals. The public remains largely unaware of the potential danger of building in the interface although homes have been destroyed in the past from wildfire.

Trees are important in the community and urban landscape. However, few homeowners understand urban tree selection, maintenance and care. Urban tree care also requires an understanding of basic tree physiology, ecology and arboriculture. Few county agents, tree service or landscape professionals are trained in these arenas. County agents received numerous calls about urban tree health, tree appraisal, and tree selection.

Stakeholder Input

Stakeholder input is received from numerous sources including County Extension Councils, Master Gardener groups, the Arkansas Urban Forestry Council, the Arkansas Forestry Commission and other interested stakeholders.

Extension personnel serve on the Arkansas Urban Forestry Council Board. Other board members include representatives from city councils, Master Gardener groups, private citizen advocates, forestry professionals, professional landscape architects, and urban forestry professionals. The AUFC Board meets quarterly. Extension specialists, in addition to serving on the board, gather input for and collaborate on educational programs including the annual Urban Forestry Conference.

Overview

Forestry specialists and county agents offer presentations to Master Gardening and other homeowner groups covering basic urban forestry topics including native trees for Arkansas, responding to storm damage, insect and disease problems, and proper pruning techniques. County agents and specialists also respond to numerous calls about urban tree health, planting, disease, and other topics. Specialists have worked with the Arkansas

Forestry Commission and others to present information about Wildland-Urban interface fires and Fire Wise Landscaping.

Extension Program Results and Accomplishments

Output Indicators

- 6 Number of educational programs held focusing upon urban tree care and urban forestry concepts.
- 260 Number of homeowners, urban foresters, county agents, Master Gardeners, arborists or the general public attending programs.
- 2 Number of training workshops designed for county agents and other natural resource professionals.
- 100 Number of county extension, state agency, and federal government personnel attending educational programs.

Outcome Indicators

- 100 Number of professional tree care providers who express an increased understanding of urban forestry planning.

Source of Funds

Smith-Lever 3b and 3c. Arkansas Forestry Commission Urban Forest Grant, International Society of Arboriculture Education program.

Scope of Impact

Dissemination – Articles about insect, ice and wind damage to urban trees received statewide coverage in local newspapers. Information is available via the web.

Each county with Master Gardening programming responsibility incorporates some level of urban forestry education. Three radio programs conducted concerning insects, ice and wind damage, and planting trees to Arkansas Agriculture Network that are broadcast to at least 5 stations throughout the state.

The Arkansas Forestry Commission and the International Society of Arboriculture hosted an urban tree health care workshop in cooperation with the UA Cooperative Extension Service.

KEY THEME:

INTEGRATED PEST MANAGEMENT

Program Response:

Area-Wide Cultural Management of Plant Bugs in Cotton

Contact: Gus Lorenz, Ph.D. Professor/Extension Entomologist/IPM Coordinator, Cooperative Extension Service, Little Rock, AR, 501-671-2191, glorenz@uaex.edu; Jeremy Greene, Ph.D., Assistant Professor/Extension Entomologist, Southeast Research & Extension Center, University of Arkansas CES, Agriculture Building, UAM Campus, P.O. Box 3508, Monticello, AR 71656, 870-460-1091 (SEREC), 870-460-1614 (office), 870-460-1415 (fax), 870-723-5537 (cell), green@uamont.edu; Glenn Studebaker, Ph.D., Assistant Professor/Extension Entomologist, Northeast Research & Extension Center, University of Arkansas CES, Keiser, AR, 870-526-2199 gstudebaker@uaex.edu

Situation

With the advent of Bollgard cotton and boll weevil eradication growers have experienced a decline in the number of pesticide applications necessary for control of heliothines and boll weevil. As a result, the tarnished plant bug, once controlled by insecticides used for heliothine and boll weevil control, has now become a primary pest of cotton in Arkansas. In recent years, Arkansas growers have experienced extremely high TPB populations in mid- to late-season cotton and have experienced problems with control and resulting boll damage. Also a factor is the increase in minimum tillage systems and Round-Up tolerant crops that favor plant bugs and other occasional pests. Recent studies have indicated that the tarnished plant bug is becoming more tolerant of conventional insecticides, and the need for alternative methods for suppressing plant bug populations has become clearly evident. Sufficient information on TPB biology in the Mid-South suggests that the tarnished plant bug is capable of sustaining and building populations on a plethora of wild hosts commonly found surrounding production fields. If these wild hosts can be removed from the system in an economical and environmentally safe way, this would help to suppress populations below damaging levels and would relieve, to some extent, the need for insecticide applications. Previous studies in Mississippi and Louisiana have shown that controlling weed hosts in the early spring can reduce resulting field populations of TPB by as much as 30-50%.

Stakeholder Input

Producers, county agents and Extension specialists recognize that this issue will continue to be of great importance as an educational program.

Overview

With the advent of *Bt* cotton, new target-specific insecticides and boll weevil eradication have all helped to decrease the need for the use of broad-spectrum insecticides that helped to control plant bugs. However, with these changes, the pest status of the plant bug and stink bug has increased. The TPB has developed high levels of resistance to many insecticides commonly used for control. However, insecticides are currently the only means of control for this pest.

Recent studies on TPB have shown that area-wide management using IPM tactics in combination over a large area can successfully suppress TPB populations. A 3-year study conducted by USDA-ARS at Stoneville, Mississippi, showed that TPB populations could be reduced 30-50% by making spring applications of herbicides around field borders. These applications deny TPB populations the wild hosts they need to build populations. Similar studies in Louisiana have shown comparable results. The strategy of early wild host destruction is compatible with currently used IPM and crop production practices and provides cotton growers with an easy, economical solution to the ever-increasing problem with TPB for Arkansas cotton growers. Use of this type of tactic should improve environmental quality and human safety by reducing the number of insecticide applications needed in cotton. For cotton growers, the value of the program is reduced cost of production and reduced risk of potential yield loss. Also, this program should decrease the potential for increased problems with insecticide resistance and enhance biological control of the TPB and other economic insect pests of cotton, thus enhancing the overall IPM program for cotton.

Extension Program Results and Accomplishments

Output Indicators

- 300 Growers, consultants and other clientele attending meetings where information was presented.
- 5 Presentations at grower meetings and field days.
- 3 Presentations at professional meetings.
- 10 Number of educational meetings held with industry representatives, state and federal agency personnel and University of Arkansas research faculty to identify

and discuss bug management issues.

Outcome Indicators

- Potential recommendations produced concerning management of plant bugs in cotton.

Source of Funds

Lorenz, G. M., J. K. Greene, G. E. Studebaker, T. Teague, D. D. Hardee, G. L. Snodgrass, and W. P. Scott. 2004. Area-wide management of the tarnished plant bug (TPB) in cotton in Arkansas. USDA-ARS Project.

Scope of Impact

Dissemination – Statewide availability of program to interested counties after additional research. Insect management information will be available through publications and presentations at county meetings.

Program Response: Cotton Integrated Pest Management

Contact: G. M. Lorenz III, Extension Entomologist - IPM Coordinator, 501-671-2191, glorenz@uaex.edu

Situation

Cotton was grown on 920,000 acres in Arkansas this year with an average yield of over 1,100 lb. of lint per acre, setting a record high yield for the state and a new production record on the number of bales. The old record was set in 1948 when over 2 million acres were in production in Arkansas. Arkansas ranks fourth in acreage and production in the United States. Insect losses due to arthropods (insects and mites) are estimated at about 5% each year for a loss of about \$41 million. Management costs to prevent or minimize the impact of these pests are estimated at almost \$159 per acre for Arkansas producers. The cost of control and loss for cotton production in Arkansas is estimated at over \$147 million dollars annually.

Cotton is the most pesticide intensive of the major row crops grown in Arkansas. IPM is an essential part of cotton production in the state in helping producers farm more efficiently and reduce reliance on pesticides as much as possible. Increasing concerns for cotton producers include herbicide drift issues, particularly glyphosate and phenoxies; decreasing soil and water quality; insecticide resistance; and how to utilize GMOs. With

the advent of transgenic cotton, particularly B.t. cotton, and boll weevil eradication, a shift in emphasis in pest status of certain insects is occurring. The stinkbug and plant bug complexes have been elevated in pest status with less applications being made for control of the bollworm/ budworm complex and boll weevil. Insecticide applications for the “bug complex” averaged over 5 applications across the state this year. Alternative methods for control of these bugs must be a priority to help growers maintain cost effective insect control. Current research is centering on cultural practices, pheromone-based monitoring, and improved scouting procedures to reduce insecticide reliance.

Other on-going concerns include insecticide resistance management of heliothines and plant bugs.

Arthropod pests continue to threaten the competitiveness of cotton production by reducing yields and increasing costs of production.

Stakeholder Input

For several years, the Arkansas Farm Bureau has identified cotton insect control as a high priority issue. The Arkansas State Support Program of Cotton Incorporated has identified insect control research as a high priority and has funded numerous grant proposals in these areas. Surveys of county agents have indicated that more information is needed due to the changes occurring in cotton production with the advent of transgenic cottons, boll weevil eradication, and changing pest status of insect pests.

Overview

In order to manage the many insect pests that threaten cotton in Arkansas, growers rely primarily on research-based information that helps them utilize the following tools: transgenic cotton, cultural practices, early warning programs including aphid fungus surveys, species identification and moth trapping, IPM meetings, and insecticides. Delivery of this information and its partial generation to growers, county agents, consultants, and industry representatives are responsibilities of this program.

As cotton is the most pesticide intensive of the major row crops grown in Arkansas, IPM is an essential part of cotton production in the state in helping producers farm more efficiently and reduce reliance on pesticides as much as possible. Increasing concerns for cotton producers include herbicide drift issues, particularly glyphosate and phenoxies; decreasing soil and water quality; insecticide resistance; and how to utilize GMOs.

In weed control, glyphosate resistant horseweed has been increasingly moving across the northeastern part of the cotton production area, and it is forecasted to soon be in all areas in just a few years. Also, glyphosate resistant ragweed has also been documented in parts of the state. With over 90% of the cotton acreage planted to glyphosate resistant cotton varieties, these factors may have serious ramifications for cotton producers.

With the advent of transgenic cotton, particularly B.t. cotton, and boll weevil eradication, a shift in emphasis in pest status of certain insects is occurring. The stinkbug and plant bug complexes have been elevated in pest status with less applications being made for control of the bollworm/budworm complex and boll weevil. Insecticide applications for the “bug complex” averaged over 5 applications across the state this year. Alternative methods for control of these bugs must be a priority to help growers maintain cost effective insect control. Current research is centering on cultural practices, pheromone-based monitoring, and improved scouting procedures to reduce insecticide reliance.

However, another concern in recent years is the increasing tolerance of bollworms to B.t. cotton. In 1996-97 growers averaged just over one application for bollworm control in B.t. cotton, in 2002 growers averaged 3 applications, and in 2003 many growers in the southeast part of the state sprayed as many as six times to control bollworm.

Arthropod pests continue to threaten the competitiveness of cotton production by reducing yields and increasing costs of production. In order to manage the many insect pests that threaten cotton in Arkansas, growers rely primarily on research-based information that helps them utilize the following tools: transgenic cotton, cultural practices, early warning programs including aphid fungus survey, species identification and moth trapping, IPM meetings, and insecticides. Delivery of this information and its partial generation to growers, county agents, consultants, and industry representatives are responsibilities of this program.

Current programs include: 1) monitoring tobacco budworm and cotton bollworm populations for resistance to widely used insecticides; 2) monitoring bollworm populations for resistance to B.t. cotton, and plant bugs to pyrethroids and organophosphates; 3) establishing new thresholds for cotton aphids utilizing beneficial insects and the aphid fungus. This work represents the first threshold of its kind in cotton where natural enemies are used to determine action thresholds; 4) determining the optimum time for insecticide termination to protect yields and reduce grower costs.

Extension Program Results and Accomplishments

Output Indicators

1,301	Growers, consultants others attending presentations.
2,184	Phone calls addressing insect questions from clientele.
1,459	Field calls to individual growers.
69	Presentations at grower meetings and field days.
101	Field demonstrations.

17	Counties participating in Cotton IPM Program.
14	Field days.
93/2,879	Newsletters on Cotton IPM/Audience.
30	Insecticide Evaluation Reports.
36	Consultant training sessions.
8	Major Extension Publications.
29	Presentations at Professional Meetings.
2	In-service trainings for county agents (in the field).
79	Number attending Cotton Insect Scout Schools.

Outcome Indicators

\$21.70 per acre	Savings per acre on insecticide cost attributed to the use of COTMAN for termination of insecticide applications.
\$12.50 per acre	Savings per acre on insecticide cost reduction attributed to the use of the Aphid Fungus detection program for determining the need for aphid control.
\$12.00 per acre	Savings per acre on application of new aphid threshold.

Source of Funds

Smith-Lever 3(d) IPM funds
 Grants (Arkansas Cotton State Support Group of Cotton Inc.)
 Gifts (Various Crop Protection Companies)
 FSL-CES

Scope of Impact

Dissemination – The Cotton IPM Program is available statewide to all counties through “hands-on” presentations, training, field days, IPM meetings held in 6 counties, field calls and visits, printed publications, and the Extension web site at www.uaex.edu.

Program Adoption – Cotton IPM presentations were made in every major cotton producing county (17). Cotton IPM field demonstrations were installed in all 17 counties

during 2003. Cotton IPM county participation has held steady at 17 counties with \$54,300 distributed in county IPM grants.

Program Response: Diversified Integrated Pest Management

Contact: Kelly M. Loftin, Extension Entomologist, Livestock, 501-671-2361

Overview

Diversified Integrated Pest Management (D-IPM) includes pest problems not associated with traditional row crop production. D-IPM programs primarily include livestock and urban pest problems. This portion of the overall IPM program is relatively new in Arkansas but has expanded considerably. In 2004, \$10,800.00 was allocated to fund competitive county diversified IPM programs. Twenty-one of twenty two D-IPM were funded. Three proposals involved fruit, nut and vegetable production (tomato, grape and pecan). Eight county programs involved livestock (beef cattle, dairy cattle, sheep and goat) pests. Three proposals were urban IPM (community fire ant abatement demonstrations Japanese beetle and mole control). One proposal was both urban and rural in nature involving new monitoring and application methods for Texarkana's black fly abatement program. The remaining dealt with pasture weed management, grain sorghum and apiculture IPM.

The horn fly, *Haematobia irritans* L., is the major pest species of beef cattle in the south. This fly spends most of its time on the animal, feeding over 30 times per day on blood. It lays eggs in fresh cattle manure, which hatch into larva and complete development in the dung. Major damage is through blood loss and annoyance. Losses include reduction in yield of milk and meat. The importance of annoyance should not be underestimated. Repeated biting of hundreds to thousands of flies producing substantial irritation to cattle causes energy to be expended in attempts to dislodge the flies. Wounds caused by horn flies serve as sites to bacterial infections. Horn flies also serve as vectors of stephanofiliaris, a nematode infestation, which results in lesions forming along the belly.

Horn flies can produce a new generation as often as every two weeks, making this pest difficult to control and quick to develop resistance. Several methods have been used to control horn flies including insecticide impregnated ear tags, insecticide sprays, back rubbers, dust bags and pour-on wormers with varying degrees of success. The advent of ear tags has led to horn fly resistance to both pyrethroid and organophosphate insecticides. Insecticide rotation has been employed as a method of countering insecticide resistance. An alternative method of control using a walk through mechanical trap (no insecticide) is in its third year of evaluation and comparison to conventional methods such as ear tags. During 2004, demonstration of this technology was added in three counties. Results have shown both grower acceptance and efficacy. Horn fly numbers from herds using the trap were maintained at or below economic thresholds for the majority of the horn fly season. Horn fly numbers on herds using the trap were similar to those using insecticide

impregnated ear tags. Another alternative method of horn fly control being evaluated is an automatic sprayer. Animals are treated with a liquid insecticide as they pass through an opening to gain access to minerals or water. This spray system will only be activated when deemed necessary by the rancher. Treatment is based on the economic threshold of 150-200 horn flies per animal. A more automated commercial model of this spray system was evaluated in 2004. Results from this model were favorable with a high degree of producer acceptance. Demonstrations using IGRs in beef cattle feed were also evaluated in 2004. The level of control and grower acceptance of this technology was also favorable. Horn fly demonstrations using alternative methods are productive educational opportunities. The county agent has an excellent educational venue in the monthly county cattlemen's association meetings. Evaluations of these technologies will be repeated and expanded again in 2005.

The housefly, *Musca domestica* L., and the stable fly, *Stomoxys calcitrans* L., are the major fly pests in and around dairy housing systems in the southern United States. They create an uncomfortable environment for farm workers, raise public health concerns about unsanitary milk handling conditions, create community nuisance problems, spread diseases from cow to cow, disrupt feeding habits of cows and lower milk production and feed conversion efficiency.

A large proportion of the fly breeding on most dairy farms occurs in calf housing and cattle resting areas where manure and bedding materials can accumulate for months before clean-out. Fly breeding in this habitat is prolific, and natural populations of parasitoids, mostly *Muscidifurax raptor*, do not become well established until 1 to 2 months after peaks in abundance of fly populations, which follow predictable seasonal patterns in the northeastern areas of the U.S. Producers often try to control the resulting fly infestations by making frequent insecticide applications, but this approach aggravates insecticide resistance problems and may limit the development of robust populations of parasitoids and predators. Interest in biological control agents for the suppression of flies on dairies is growing. Aware of the increasing cost of insecticides, decreasing availability of new chemicals and the development of insecticide resistance in resident fly populations, farmers recognize the cost effectiveness of integrated pest management strategies.

As a result of successful Dairy Filth Fly IPM programs (SARE and D-IPM sponsored program) in Washington, Van Buren and Searcy counties, a multi-state, multi discipline Southern Region SARE Research and Education Grant was awarded. UACES is the lead institute with cooperators at NCSU, Mississippi State University and UA Experiment Station. This project compares the cost and effectiveness of manure management, parasitoids, and conventional insecticides against house and stable flies. Preliminary work began in 2004 and will continue through 2007. Fly surveillance, sanitation and treatment thresholds are the core of the educational component. Research will focus on species distribution and abundance of naturally occurring pteromalid species as well as optimal release rate, duration and dispersal of augmented releases. Additional programs involving horn fly control with walk-through horn fly traps expanded into additional dairy counties. Results from 2003 and 2004 have shown that this method of horn fly control is accepted by dairymen and cattlemen and can keep horn fly numbers below economic thresholds.

Buffalo gnats, *Cnephia pecuarum* (Riley), are bloodsucking flies in the family Simuliidae that breed in fast-flowing streams and rivers. During severe buffalo gnat outbreaks, tremendous livestock losses including death occur. Because of severe economic losses to the cattle industry and the International Paper Mill (gnats in paper reduce quality), Miller County, Arkansas, Bowie

County, Texas, the Arkansas Livestock and Poultry Commission and International Paper are involved in a long-term area control program. The most effective method of control is to treat the Sulfur River with a bacterial insecticide (Bti) prior to emergence of adults. Extension's role in the program is to provide expertise and technical support during treatment of the river and to determine the optimal time to treat by monitoring the population of immature buffalo gnats developing in the river. Through support from the D-IPM program, larval sampling for buffalo gnats has been improved by standardizing the collection methods through use of artificial substrates. Both immature sampling and actual treatments now employ use of GPS to determine optimal sampling and treatment sites along the river. In 2003 and 2004, adult trapping systems using carbon dioxide and octanol were used to better determine the buffalo gnat dispersal from breeding sites. A new application system that meters Bti from the boat-mounted tank into the river without using a mechanical pump was another successful outcome of the buffalo gnat program. This system, along with use of the GPS system, has increased the precision of Bti applications into the Sulfur River. Both technologies were adapted by Texas cooperators in 2004.

Japanese beetles are a recent addition into Arkansas' list of pests. Impact on Arkansas' horticulture and other agronomic industries and urban landscape has only recently become an issue. Beginning in 2003 and 2004, season-long monitoring in Washington, Crawford, Benton and White Counties was initiated. This program has been very successful in involving Master Gardeners and has led to numerous educational programs (Master Gardener seminars, production workshops and display presentations). Japanese beetle populations have expanded to the point that the Northwest Regional Airport in Highfill is quarantined by USDA APHIS (monitoring for JB beetles presence in certain flights to California). In 2005 the program will expand to surrounding counties where Japanese beetles are beginning to infest.

A pecan IPM program was initiated in 2003 in Lafayette County. This program involved surveillance and trapping of major pecan pests. Trapping and surveillance data was used to give producers a "heads up" as to when major outbreaks are likely to occur and alert them to increase their own surveillance. This program expanded into Miller County in 2004. The Miller County program added training of Master Gardeners in Pecan IPM to help assist in the IPM program.

Crawford County's D-IPM grant to manage filth flies associated with alternative livestock (goats and sheep) was concluded in 2004. This program included a fly surveillance and identification program at 8 farms to determine species composition and abundance. Additional focus included comparing the release of commercial parasitoid wasps versus conventional insecticide treatment and fly baiting in terms of efficacy and costs. The youth component of this project involved 7 youth (4 4-H record books and 2 science fair projects). Cooperators were pleased with initial results and enthusiastic that CES was becoming involved in answering their concerns. The program will likely be expanded into Grant County in 2004 with similar producer and 4-H youth input.

The second Livestock Pest In-Service training to be held in several years occurred in June 2004. In contrast to 2003, the 2004 in-service emphasized poultry and alternative

livestock pests instead of beef cattle pests. Presenters were Extension and research faculty from Pest Management and Animal Science within the University of Arkansas System. The in-service was attended by 31 county agents, 5 Extension specialists and 2 research faculty.

Stakeholder Input

Ranchers, farmers, master gardeners, neighborhood organizations and county extension councils are often the primary driving force behind county diversified IPM programs. Like other successful programs local needs (specific pests of the community) drive diversified IPM programs. Client feedback from calls and office visits is another driving influence on D-IPM program initiation.

Extension Program Results and Accomplishments

Output Indicators

- 21 Counties participated in the D-IPM program.
- 36 D-IPM training meetings.
- 23 Field days/Farm tours (includes 5 urban).
- 1,091 producers attended D-IPM training meetings (includes 189 urban).
- 25 newspaper articles.
- 17 newsletters addressing D-IPM.
- 61 D-IPM demonstrations (includes 23 urban).
- 43 miles of Sulfur River monitored for immature black flies on 11 sampling dates.
- 16 youth directly involved in D-IPM projects (science fair projects and 4-H record books).
- 4 poster presentations (Regional, Local and National Professional meetings).
- 128 livestock and dairy producers monitor pest populations prior to initiating control and employ manure management practices to lessen impact of fly pests.

Program Impact

- 12 additional dairies have adopted fly surveillance and manure management into their

filth fly management program reducing reliance on insecticides to control flies around dairy facilities.

- 16 additional beef producers have adapted horn fly surveillance as part of their horn fly control program.
- 4 Fruit producers adopted new insect management technology.
 - Because demonstrations have shown Amelia tomato variety has comparable yield and quality to the standard variety, many tomato producers in southern Arkansas will plant Amelia (resistant to TSWV) instead of non-resistant Mountain spring (standard).
- 1 Buffalo gnat management program (area management). Protects livestock in Miller and Bowie Counties (Texas) and protects paper mill.
- 1 new neighborhood fire ant abatement program established.
- 3 Pasture weed management projects.
 - In the first year of a varroa mite surveillance program for 3 commercial beekeepers in NE Arkansas saved about \$18,000 in miticide by reducing mite treatments by one. Since Varroa mites have shown some resistance to labeled miticide treatments this project may help delay the onset of miticide resistance.
 - Black fly abatement program (area two state program) has been greatly enhanced by improved the surveillance system and use of GPS technology for more accurate insecticide treatment to the river.

Source of Funds

Smith-Lever 3(d) IPM funds, grants (SARE), gifts (various pesticide companies), and FSL-CES.

Scope of Impact

Dissemination – Diversified IPM programs are available to all counties where a need exists to manage pests in a more efficient way.

Scope of Program – Twenty counties implemented substantial Diversified IPM programs during 2004 and include Searcy, Van Buren, Independence, Sharp, Fulton, Clark, Clay, Dallas, Perry, Franklin, Miller, Bradley, Cleveland, Craighead, Crawford, Polk, Sebastian, Washington, and Yell Counties. Doug Petty in Miller County, John Gavin in Bradley County, Carey Wall in Crawford County and Bobbie Hall in Dallas County have implemented very successful programs and are excellent contacts for program development consultation.

Program Response: Fire Ant Management

Contact: Kelly Loftin, Pest Management Section, 501/671-2361, kloftin@uaex.edu; John Hopkins, Pest Management Section, 501/671-2000, jhopkins@uaex.edu

Situation

Fire ants cost Arkansans money – money lost in damages and money spent to minimize the ant’s impact on their lives. Money is lost by agriculture in reduced yields and in repair to electrical equipment around structures. There are also medical costs associated with the sting of the fire ant. The transportation industry is impacted due to the increased erosion due to fire ant trails across gravel roads. The incorrect use of pesticides and home remedies for fire ant management can contaminate surface and ground water that can be a great environmental cost.

Our program focuses on education of homeowners, agriculturists, and youth in proper methods of fire ant management. Our goal is to educate Arkansans about fire ant identification, biology, pesticide types, proper use of pesticides, fire ant abatement programs, and the future potential of biological control as they relate to fire ant management. Program goals are achieved through county and state educational programs such as demonstrations, applied research, education booths, organized abatement demonstrations, presentations, publications, newsletters, web pages, in-service training of county faculty, and news releases.

Stakeholder Input

We involve several groups of stakeholders including the Governor-appointed Fire Ant Advisory Board. The In-House Advisory Committee composed of six county agents and one administrator is also a stakeholder group. They represent the 75+ agriculture agents

who are impacted by our programming. Various county councils have identified fire ants as a concern, and we qualify those groups as stakeholder groups.

Overview

Extension's role to educate Arkansans is vital to the development of a fire ant management program. An educated Arkansan knows that eradication of this pest is not possible and becomes receptive to methods used in the management of this pest. The red imported fire ant (*Solenopsis invicta*), is a pest of both rural and urban Arkansans. It impacts the urban dweller in Little Rock with its painful sting and the hay producer in south Arkansas due to the mounds it builds in the hay meadow. To date, the red imported fire ant can be found in well over 40 Arkansas counties. Thirty-three Arkansas counties are in the Federal Fire Ant Quarantine area. The placement of these counties within the quarantine area has implications to businesses due to the restrictions the quarantine places on the movement of specified material out of the area, and to non-infested counties adjacent to quarantined counties.

Education is critical, because the management of fire ants is not simple. The potential misuse of pesticides and other toxins used by individuals trying to control fire ants, the potential health hazards of the ants, and economic significance of this pest need to be understood by an individual or community trying to control this pest. The educational tools being used include videos, public service announcements, the world-wide-web, public presentations, public demonstrations, and printed material. In the past several years, these tools have been used successfully in many Arkansas counties. Many of the success stories relating to the fire ant education effort can be found in many of the newly infested areas, but also can be found in areas known to have fire ants for over 20 years.

The distribution of fire ant education materials continues throughout all the fire ant infested areas through the county offices. However, since 1997, many of the publications can be accessed via the world-wide-web on the Red Imported Fire Ant Home Page through the main web site at www.uaex.edu. A collaborative effort within the fire ant infested region resulted in the publications "Fire Ant Management in Urban Areas" and "Fire Ant Management in Agriculture." These publications were printed in Arkansas and have been very well received.

"The Ant Underground," a youth-oriented CD-ROM is completed after almost five years of work. "Hands-on" is the educational method of choice today, and the CD-ROM was developed to do that. The program covers the history, biology and management of fire ants. Teacher lesson plans are included in the project.

Fire ant control demonstrations were conducted in a majority of infested counties within and outside the imported fire ant quarantine area. Demonstrations of fire ant management products and techniques continue to be vitally important to the success of the fire ant education effort. The efforts of our county Extension agents to educate their clientele on

this issue are very important to the success of our fire ant education efforts. Demonstrations at highly visible sites such as parks, fairgrounds, pastures, cropland, gardens and residential lawns continue to be the backbone of the demonstration program. Fairground demonstrations have been targeted in hopes of demonstrating to fair boards that fire ants can be managed in these potential sources for countywide infestations in non-quarantined counties. Several counties had extremely good responses to news articles and control demonstrations on the impact of correct pesticide treatments. Five agents attended the National Imported Fire Ant Research Conference in Baton Rouge, Louisiana, to present results of their work.

Cooperative research projects with pesticide manufacturing companies developing new fire ant management products is enabling Arkansas to become familiar with several products prior to their potential labeling as a fire ant management products. These projects have helped the program in staying a step ahead of many of the new product releases and the potential problems associated. In response, three applied research projects evaluating potentially new chemistry against RIFA were conducted in 2004.

The release of two biological control agents in 2002 increased Arkansans' awareness of fire ant management options on a state and federal level. Cooperatively with USDA-ARS and USDA-PPQ, the phorid fly, *Psuedacteon tricuspis*, and the *microsporidia* *Thelohania* were released in three counties. The fly was released in Pike and Bradley counties, while the *microsporidia* was released in Miller County. Agents from several counties were involved in the release process. Learning about the release process and actually participating in the releases increased their confidence. In 2003 and 2004, the fly was found to have survived in Pike County, but no flies were discovered in Bradley County. A second Bradley County release of the fly was implemented in late September 2003; however, flies have not been recovered from that release. In the spring of 2004, phorid flies were released in Miller County, and in late fall flies were recovered from that site.

Public meetings throughout the state and fire ant educational displays at public venues such as county fairs are important to reaching people also. People need to see and hear firsthand about fire ants and the methods recommended to control them. The Extension Service's agents at the county level are aware of the fire ant problem and are comfortable in the leadership role in educating their clientele of the options available in managing for this pest.

An emphasis area of our educational effort is fire ant abatement. The Texarkana program in Miller County has over 500 homes, and the program is in its eleventh year of existence. Arkansas City in Desha County is a program established and run by the residents of the community. The city government has really "bought into" the fire ant abatement program, and the citizens like the results of the program. Rebecca Bock Thomas, Grant County agent – agriculture, cites the program as an example of Extension truly at work. Extension presented the program idea, the citizenry took ownership of the program, and the program continues with Extension personnel involved in an advisory capacity only. There are other more neighborhood-oriented programs throughout the state. There are fire ant abatement programs in Faulkner, Calhoun, Grant, and Nevada counties.

Extension Program Results and Accomplishments

Output Indicators

- 15 Number of educational publications (multi-state) and materials produced including videos, CD-ROMs, and slide sets necessary to conduct the statewide fire ant educational program.
- 120 Number of educational meetings and seminars held to inform homeowners, grower groups, community leaders, elected officials, and specialized groups about imported fire ant biology, impact, and management.
- 17 Number of fire ant educational programs in public schools.
- 17 Number of fire ant abatement demonstrations in residential, agricultural, and public industrial areas.
- 5 Number of TV, radio, and Internet programs to increase fire ant awareness.
- 4,600 Number of people attending educational meetings, programs, and seminars.

Outcome Indicators

The people are listening and are aware of fire ant management options. Discussions during and after various meetings have shown people are aware of many of the options in

a fire ant management program. Questions to agents on newly released products have increased. Sales of many of the bait products are up according to many agents' informal surveys of local merchants.

The continuation of abatement programs in Arkansas City, Texarkana, and Prescott proves that once people apply many of the management options introduced to them by county agents and other Extension-educated people, the programs continue due to their benefits. A majority of phone calls to county offices during the spring through fall are fire ant related. Since the agents are comfortable with the information they have received from the specialist, they answer calls with confidence.

Source of Funds

State appropriation.

Scope of Impact

Dissemination – This program is available to all the counties in the state. However, an emphasis is made on those counties within the Federal Fire Ant Quarantine area. Materials are distributed on a request basis, and through in-service training.

Program Adoption – A majority of Arkansas' 75 counties have delivered this program; however, approximately 45 use it regularly.

Programs of Excellence

Fire Ant Research and Education – New IPM Tool Against RIFA in Arkansas

General Program Information – Integrated Pest Management is a system of management that promotes the use of more than one method to combat a pest. In the fight against fire ants, another method has been added to the management options against them – biological control. A long term IPM project involving USDA APHIS, USDA ARS and UACES includes multiple releases of phorid flies and continued evaluation of the fly's impact and establishment. A phorid fly, *Pseudacteon tricuspis*, was released in Spring 2002, and has now been approximately 15 miles from its release site in Pike County. It was also released in Bradley County in 2002 and 2003; however, it does not appear to have survived. In the spring 2004 it was released in Miller County and appears to have survived. *Pseudacteon tricuspis* and *Pseudacteon curvatus* will be released in separate locations in Arkansas. Entomologists are hopeful that this parasitic will reduce the impact of the ant on Arkansans. The fly doesn't directly kill that many ants, but its presence reduces the ant's activities, such as foraging, and reduces colony fitness which, it is hoped, increases the success of native ants in their battle for food and space.

Names of Counties or Locations Involved – Pike, Miller, Bradley, and Clark

CES Section Contact Person – Kelly Loftin, Extension Entomologist - Livestock, 501 671-2361, kloftin@uaex.edu , John Hopkins, Extension Entomologist - Urban, 501-671-2000, jhopkins@uaex.edu

Program Response: Improved Efficiency in Crop Management Through Nematode Control

Contact: Terry Kirkpatrick, Nematology - Cotton and Soybean Specialist, 870-777-9702, Pest Management

Situation

Arkansas ranks ninth in the U.S. and first in the south in the production of soybeans. A major constraint to optimum production in our state is the wide distribution and annual occurrence of soybean diseases and nematodes. Disease development in soybean fields may lower yield by 10 to 50 percent (more in certain situations) if left unmanaged. The development of effective resistant soybean cultivars has been a tremendous advantage for growers, but the number of new cultivars that come on the market each year can lead to confusion in selecting an appropriate cultivar for a particular farm. Each year growers have to choose among well over 200 soybean cultivars, many of which have limited or no information available on their disease resistance level to common soybean pathogens. Since only one cultivar can be grown in each individual field, selection of the most appropriate cultivar is usually quite difficult, and selection of the wrong cultivar can lead to significant yield loss.

Stakeholder Input

A limited program to evaluate new soybean cultivars for resistance to a few key diseases has been conducted since 1990. Conversations and grower input in the last few years have indicated that the resulting information was extremely valuable in cultivar selection each year, but that widening the scope of the program to include the majority of our important diseases was needed. A more complete program to screen new cultivars that come available commercially each year for resistance to an expanded number of fungal and nematode pathogens was designed. A proposal for financial assistance in maintaining and conducting the program annually was developed and submitted to the Arkansas Soybean Promotion Board in January 2003. This proposal was funded by the ASPB and provided the necessary funds for personnel to conduct the program under the guidance of Rick Cartwright (CES) and Terry Kirkpatrick (SWREC).

Overview

Mr. Mark Trent (M.S., Oklahoma State University) and Ms. Kimberly Hurst (B.S., Arkansas State University) continue to implement the “real-time” cultivar evaluations for various soybean diseases. Again in 2004, we evaluated more than 250 commercial cultivars and a number of breeding lines in cooperation with the Variety Testing Program, headed by Don Dombek.

Screens Conducted in 2004

Root-Knot Nematode. Greenhouse screen conducted by K. Hurst and T. Kirkpatrick at SWREC. Field evaluation of last year’s R and MR cultivars conducted by Cliff Coker at Dermott, Arkansas.

Soybean Cyst Nematode. Greenhouse screen for races conducted by K. Hurst and T. Kirkpatrick at SWREC.

Reniform Nematode. Greenhouse screen conducted by R.T. Robbins at UAF.

Stem Canker. Field screening using supplemental inoculation and overhead irrigation conducted in the SWREC stem canker nursery by K. Hurst and J. Barham. All cultivars in the soybean performance program were evaluated for disease severity and yield.

Frogeye Leaf Spot and other general foliar diseases. Field screen conducted at the Pine Tree Experiment Station, Cotton Branch Station, Southeast Extension and Research Center and other locations by M. Trent and R. Cartwright.

Aerial Blight. Field screen conducted in commercial field in Clay County by M. Trent and R. Cartwright.

Sudden Death Syndrome. Evaluated at the Cotton Branch Station and in various fields and demonstrations in east central and northeast Arkansas by Mark Trent and John Rupe.

Results from all the screening efforts were posted to the Arkansas Variety Testing web site from September through November and provided to Dr. Chris Tingle for the Soybean Update and to Mr. Don Dombek for variety testing publications in early December 2004. Results were also used to revise SOYVA, a variety selection computer program for Arkansas growers.

Extension Program Results and Accomplishments

Output Indicators

- 250 or more cultivars and advanced lines were screened for resistance to soybean

nematode, two root and stem diseases, and various foliar pathogens.

- All information was made available to Arkansas soybean producers via Internet, soybean cultivar computer selection program, and hardcopy publication before January 1, 2005.

Outcome Indicators

- Soybean producers statewide utilize this information for cultivar selection for the 2005 season. Soybean industry personnel are also using this information to update or supplement the information they supply to the public relative to specific soybean cultivars they market.
- This program is the most complete and extensive attempt to provide growers with useful information relative to the disease risk of new cultivars. These data are being utilized extensively throughout the mid-South.

Source of Funds

This work has been supported through the Arkansas Soybean Promotion Board, and the University of Arkansas Division of Agriculture.

Scope of Impact

All Arkansas soybean growers and soybean personnel throughout the southern U.S.A. Midwestern breeding companies and universities also request these data.

Dissemination – This information has been shared with Arkansas producers, public and private soybean breeders and plant pathologists, seed dealers and unit leaders from various laboratories.

Program Response: Management of Stink Bug in Cotton

Contact: Contact: Jeremy Greene, Ph.D., Assistant Professor/Extension Entomologist, Southeast Research & Extension Center, University of Arkansas CES, Agriculture Building, UAM Campus, P.O. Box 3508, Monticello, AR 71656, 870-460-1091 (SEREC), 870-460-1614 (office), 870-460-1415 (fax), 870-723-5537 (cell), greene@uamont.edu; Glenn Studebaker, Ph.D. Assistant Professor/Extension Entomologist, Northeast Research & Extension Center, University of Arkansas CES, Keiser, AR, 870-526-2199, gstudebaker@uaex.edu; Gus Lorenz, Ph.D. Associate Professor/Extension Entomologist/IPM Coordinator, Cooperative Extension Service, LRSO, Little Rock, AR, 501-671-2191, glorenz@uaex.edu

Situation

Arkansas agriculture faces many issues related to insect management that have the potential to greatly impact profitability for many producers. One of the most significant issues concerns shifts in insect pest status. The stink bug complex is an excellent example of a pest group that has shifted in importance and continues to draw attention. Stink bug management has increased in importance in many major crops in Arkansas, including cotton, soybeans and rice. Stink bugs are often associated with emerging pests following eradication of the boll weevil in cotton. Economic thresholds for stink bugs need to be updated in changing production systems and producers educated on biology and control. Many important species have developed tolerance to commonly used insecticides and availability of alternative chemistries is important to the future management of stink bugs.

Stakeholder Input

Producers, county agents and Extension specialists recognize that this issue will continue to be of great importance as an educational program.

Overview

Thresholds – In cotton with limited broad-spectrum insecticide use for tobacco budworm, *Heliothis virescens*, and cotton bollworm, *Helicoverpa zea*, (i.e., Bt cotton) and in areas with significantly reduced insecticide use for control of boll weevil, *Anthonomus grandis*, severe infestations of stink bugs can develop and cause considerable losses to yield and fiber quality. High amounts of stink bug damage to developing bolls can result in yield losses exceeding hundreds of pounds per acre and price reductions due to inferior lint quality. Further development and validation of monitoring methods, thresholds and control strategies for stink bugs in Arkansas/Mid-South cotton will facilitate the implementation of recommendations concerning their management in the future.

Insecticide Efficacy – Limited or reduced broad-spectrum insecticide use for major pests of cotton such as tobacco budworm, *Heliothis virescens*, cotton bollworm, *Helicoverpa zea*, and boll weevil, *Anthonomus grandis*, promotes infestations of secondary pests such as stink bugs. Typically, populations of stink bugs are controlled coincidentally with insecticides applied for major pests, but in cotton with reduced insecticide usage (i.e., Bt cotton and weevil-eradicated areas), stink bugs can develop and cause considerable losses to yield and fiber quality. In addition to the need for development and validation of thresholds for stink bug control in Arkansas cotton following BWEP, we continually need information concerning the efficacy of insecticides currently and potentially available for cotton insect control.

In many areas of the Cotton Belt, successful eradication of the boll weevil, expanding use of transgenic Bt cotton and advances in lepidopteran-specific insecticide chemistry have all contributed to a changing pest complex in cotton. As a result of these events, use of broad-spectrum insecticides has declined considerably and provided the opportunity for secondary pests to avoid coincidental control. Stink bugs have emerged as an extremely important group, and monitoring and management techniques have been evolving to deal with this problem. To aid in this effort, information is needed concerning the extent of specificity of emerging materials designed for control of worm pests. Data demonstrating the efficacy of new cotton insecticides on stink bugs have been generated, but additional data are needed. Also, data are needed that evaluate commonly used broad-spectrum insecticides for differences in stink bug control, especially between species.

Extension Program Results and Accomplishments

Output Indicators

- 2,000 Growers, consultants and other clientele attending meetings where information was presented.
- 100 Phone calls addressing questions from clientele.
- 25 Field calls to individual growers.
- 20 Presentations at grower meetings and field days.
- 15 Field demonstrations where stink bug management was involved.
- 10 Popular press articles or interviews released and utilized by numerous outlets.
- 10 Insecticide evaluation reports.
- 5 Consultant training sessions.
- 2 Extension publications on stink bug identification – fact sheet FSA7058 and MP438.
- 10 Presentations at professional meetings.
- 2 In-service trainings for county agents.
- 80 Number attending Cotton Insect Scout Schools.
- 5 Number of educational meetings held with industry representatives, state and federal agency personnel and University of Arkansas research faculty to identify

and discuss stink bug management issues.

5 Number of training meetings conducted for agents and producers.

Outcome Indicators

- Written recommendations produced concerning insecticide control of stink bugs in cotton in MP144.

Source of Funds

Greene, J. K. 2004. Evaluation of insecticides for control of stink bugs. Cotton Incorporated – CORE-funded project. Principal Investigator.

Greene, J. K., D. R. Johnson, J. D. Hopkins, G. Lorenz and W. Robertson. 2004. Validation of Boll Injury Thresholds for Stink Bugs in Cotton. Cotton Incorporated – state-supported project. (3rd year of 3-year project). Principal Investigator.

Greene, J. K., B. R. Leonard, J. Reed, and S. Turnipseed. 2004. Multi-State Project: Management of Stink Bugs/Plant Bugs in Cotton. Cotton Incorporated – CORE-funded project. Principal Investigator.

Efforts for education on management of stink bugs in cotton were funded by grants from the Arkansas Cotton Research and Promotion Board, gifts from various crop protection companies and FSL-CES budgets.

Scope of Impact

Dissemination – Statewide availability of program to interested counties. Insect management information available through publications and presentations at county meetings.

Scope of Program – Educational meetings were held in most cotton producing counties including Chicot, Ashley, Drew, Desha, Lonoke, Pulaski, Lee, Lincoln and St. Francis.

Program Response: Pesticide Applicator Training

Contact: Ples Spradley, Pesticide Assessment Specialist, Pest Management Section, 501-671-2234

Situation

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 recertified 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.

Stakeholder Input

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.

In order to produce food and fiber and protect the environment and human health, safe use of pesticides is essential.

Overview

Initial certification and recertification training sessions for private and commercial/non-commercial pesticide applicators are conducted statewide each year. County agricultural Extension agents provide the training for private applicators (farmers), and the pesticide assessment specialist is responsible for training the commercial/non-commercial applicators. Private applicators must be retrained every five years while commercial/non-commercial applicators are retrained every three years.

The training sessions last from 2 to 6 hours depending on the category and whether it is initial or recertification training. The sessions include information on spray drift management, pesticide labeling, safety precautions, pesticide regulations, first aid, protective gear, storage, handling, disposal, integrated pest management, environmental concerns, application equipment and calibration, groundwater protection, heat stress management, pesticide record keeping, and nitrogen management.

There are approximately 22,000 private applicators and 3,400 commercial/non-commercial applicators in Arkansas that are certified/recertified via the Extension Service's Pesticide Applicator Training Program.

Extension Program Results and Accomplishments

Output Indicators

3 educational publications, 19 slide sets, 9 study guides and other materials

produced as needed to conduct the program.

112 Number of educational meetings held to certify or recertify commercial and private applicators.

7,188 Number of individuals attending pesticide educational programs.

Outcome Indicators

1,617 Number of commercial applicators certified and recertified.

5,571 Number of private applicators certified and recertified.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – All private and commercial/non-commercial pesticide applicators in Arkansas. Certification and recertification pesticide applicator training sessions are also open to the public.

Program Adoption – All counties in the state.

Program Response:

Plant Disease Detection and Diagnosis

Contact: S. R. Vann, Ph.D., Assistant Professor, Extension Plant Pathologist, Pest Management Section, 501-676-3124 (office) or 501-944-0857 (cell), Plant Disease Clinic, 2201 Highway 70 East, Lonoke, AR 72086, svann@uaex.edu

Overview

The Plant Disease Clinic was established at the Lonoke Agricultural Extension and Research center in 1992 for the purpose of providing disease diagnosis on a wide variety of agricultural crops grown in Arkansas. The clinic also serves to connect people to agriculture through education and service. The clinic is very active in providing plant pathology training and educational programs to growers and other clientele through the Master Gardener program that impacts all Arkansas counties. The clinic is an essential component of the growing urban/commercial horticulture segment of the population, addressing problems and providing solutions to growing valuable crops that contribute to a thriving economy.

Because of its geographic location, climate, and tourist activity, Arkansas is especially susceptible to the introduction of new and emerging plant pathogens. Some of these pathogens, particularly on ornamentals and field crops, have the capability to cause excessive crop losses and disrupt the food supply for the United States population. With its 1.555 million acres of rice, 620,000 acres of wheat, 900,000 acres of cotton, and 3.15 million acres of soybeans harvested in 2004, Arkansas produces a significant portion of field-grown food and fiber in the United States. After September 11, a new awareness of bio-terrorism activity is being realized. The introduction of potentially harmful plant pathogens into food-producing areas becomes a real issue. The mission of the Plant Disease Clinic is to establish a solid link to county Extension agents and other “first detectors” such as Master Gardeners in the recognition and identification of plant diseases that may potentially be harmful to our agricultural ecosystem. Disease identification will become increasingly important as commercial and urban agricultural operations increase. More attention is being paid to the home gardener as evidenced in the Master Gardener program expansion.

Golf course personnel, sod producers, landscape organizations, and backyard gardeners rely on research-based programs delivered to the county offices and university departments.

Extension Program Results and Accomplishments

Output Indicators

- Over 50 multi-county Master Gardener disease-related training presentations with statewide coverage.
- 1,363 total plant samples (to date) examined in the Plant Disease Clinic (Number of samples have remained four-fold for the past 5 years.)
- More than 600 Master Gardener participants trained from all three districts of the state (Ozark, Delta, and Ouachita).
- Extension Miscellaneous Publication (MP) 154 updated with the latest disease control recommendations.
- Agent training related to disease identification and first detector training
- 9 timely disease related news articles in print media
- 520 phone contacts in reference to disease problems and diagnoses

Program Impact

- Sample numbers from turf and ornamental growing areas have increased over last year. Overall plant samples have declined. This may be due to agents' increased participation and knowledge of ornamental and other non-row crop disease identification training in addition to an increase in digital image submissions from county Extension offices and commercial growers. Digital images of plant problems are becoming an integral component in the overall operation and function of the plant disease clinic during 2003-2004.
- The clinic has been selected to become a portion of the Southern Plant Detection Network for plant pathogens that may pose a potential bio-terrorism threat. The clinic will be the hub of reporting and identifying pathogenic agents to the Southern Regional Plant Disease Clinic in Florida.

Source of Funds

Federal Smith-Lever – CES and gifts supporting the Extension plant pathology program.

Scope of Impact

Dissemination – A Plant Disease Clinic web page is available on the University of Arkansas Extension web site. Relevant publications in 2004 included MP154, *Plant Disease Control*, MP 444, *Ornamental, Tree and Turf Pest Control Training Manual*, MP 445, *Golf Course Pest Control Training Manual*, *Product Guide for Arkansas*, FSA7530, *Black Spot of Rose*, FSA-7525, *Daylily Rust*, FSA-7527, *Rhizoctonia Large Patch Disease of Zoysiagrass and Bermudagrass*, FSA-7529, and *Control Root Knot Nematodes in Your Garden*. More emphasis on ornamentals and other horticulture crops is planned for 2005. Handouts prepared relating to sample collection and plant disease references for all major commodity crops in Arkansas. Over 200 digital images of plant disorders have been received into the clinic for 2004. This number represents a two-fold increase over 2002 numbers.

Scope of Program – The activities of the Plant Disease Clinic are specific to Arkansas and its agricultural component. Plant disease education programs are presented to all interested counties that have an agricultural sector. The plant disease clinic continues to help connect the citizens of Arkansas and agriculture through service and education.

Program Response: Precision Chemical Applications

Contact: Dennis R. Gardisser, Biological and Agricultural Engineering, 501-671-2241, dgardisser@uaex.edu

Situation

Agricultural chemicals, pesticides and plant nutrients, comprise a major portion of the dollars spent by producers of all agronomic crops. The primary emphasis of this program continues to be making chemical applications more efficacious and environmentally sound.

Stakeholder Input

Commercial aerial applicators promote these activities, help publicize and provide certification credits through their national affiliation.

Overview

Over 1,000 aircraft pattern analyses were performed on more than 176 Arkansas aircraft for both spray and granular type applications at 14 agricultural aviation workshops conducted by Extension. Ground application workshops have also been conducted, featuring specifically targeted instruction to enhance chemical applications for the following general group categories: ground operated custom applicators, cattlemen, lawn and turf, row crop producers, forestry, research and technology, agricultural chemical development and marketing groups. In addition, Extension has again led the way with a section 24C label for aerial application of Command7 herbicide to rice.

Drift reduction demonstrations were held in several workshops, and a workshop was held to demonstrate the key parameters to several key EPA personnel. These parameters included application speed and height, use of drift control agents, nozzle setup and design and operating pressure. A major effort was made at this year's fly-ins to help aerial applicators correctly calibrate their equipment to help avoid major drift concerns. Data from these field demonstrations is being continually utilized by the Arkansas State Plant Board to develop regulations.

Extension has also provided many additional government agencies with guidance and assistance concerning chemical application problems. Examples include Arkansas Highway Department, Arkansas Department of Corrections (ADC), Little Rock Veterans Hospital, several municipalities and the Arkansas State Plant Board. The Plant Board has repeatedly requested both advice and assistance from Extension with many of their ongoing chemical application enforcement actions and policy-making hearings. ADC has again requested assistance from Extension in writing their application guide and bid

procedures for all their pesticide, fertilizer and seeding operations. ADC required aerial applicators to participate in Extension calibration programs in order to be eligible for their bid process. Many aircraft were certified through the standard fly-ins during the spring.

The national program, called PAASS (Professional Aerial Applicator Support System), is being developed, with many components being modeled after ongoing Extension programs in Arkansas. Engineers serve on the content committee for the PAASS program and co-authored the application technology section with engineers from Illinois and Kansas. Much of the application technology session being presented in this program this year came from Arkansas Extension materials. This program was presented to 388 operators in Arkansas in January of this year.

Insurance companies have begun requiring that aerial operators participate in PAASS and/or Extension Self Regulating Application and Flight Efficiency S.A.F.E. workshops. In some cases participation may affect the rate and in others it may be the deciding factor of whether or not a quote will be provided.

Nitrogen fertilizer prices have again hit an all-time high along with natural gas prices earlier this year. Several on-farm workshops were conducted to help growers adjust trucks and buggies to obtain optimum efficiency. This effort was done in both row crops and in many of the state's pasture-growing areas.

Several commercial and private applicators have been advised on how to best use their mixing and loading facilities to meet EPA guidelines and enhance environmental stewardship. Several new aerial applicator loading and handling facilities were designed and have either already been constructed or are under construction. Several new facilities are in the planning phases. These facilities were designed to meet all current and foreseeable EPA and state guidelines and will serve as an example for other commercial aerial applicators wishing to construct similar facilities.

Extension Program Results and Accomplishments

Output Indicators

- 12 Fly-ins – Aircraft calibrations for both spray and dry materials. Droplet size and potential drift evaluations.
- 8 Educational meetings on pesticide rinse and containment facilities.
- 3 Pesticide rinse and containment demonstration facilities constructed.
- 33 Educational meetings with applicators and producers on chemical application technology.

Outcome Indicators

>1,000 Aircraft calibrations.

35 Producer and operator facilities under construction using methods and techniques illustrated in demonstration projects.

Source of Funds

FSL, user fees \$175/aircraft/year, and EPA 319h grant.

Scope of Impact

Dissemination and Scope of Program – These are statewide activities. Several participants come from surrounding states – Mississippi, Louisiana, Texas, Missouri, Tennessee and Oklahoma. Also distributed to Canada and Australia.

Program Response: Rice Integrated Pest Management Program (IPM) for Arkansas

Contact: R.D. Cartwright, Ph.D., Extension Plant Pathologist, Pest Management Section, 501-671-2228, rcartwright@uaex.edu

Situation

Arkansas is the largest rice-producing state, averaging 1.5 million acres per year. Commercial rice production also receives a large share of the fertilizer and pesticide applications made in Arkansas annually. New varieties and production technology have encouraged heavier applications of nitrogen fertilizer and pesticides to achieve the highest yield. However, research has shown that the most profitable rice production results from pesticide decision thresholds and more efficient fertilizer methods. Research has also shown that good cultural practices minimize rice pests and the need for frequent pesticide applications. The Rice IPM Education Program encourages integrated pest management in Arkansas rice production. The program provides funding and other support to county Extension agents through a grant system, and all major rice counties have consistently participated the past several years.

Stakeholder Input

Input comes from county agents, County Extension Councils, consultants, and growers each year to guide the local county Rice IPM Program. From this input, county agents

write a grant proposal and submit it to the Rice IPM Program Committee within the University of Arkansas Cooperative Extension Service. Stakeholders routinely request more specific information or specific demonstrations to address integrated pest management questions about rice in their respective counties.

Stakeholders in the counties are also asked to actively participate in IPM program demonstrations and other education efforts. This has resulted in many rice producers experiencing “hands-on” Rice IPM on their farms.

Overview

The Rice IPM Program provides grant funds to counties that develop and implement county Rice IPM Education programs. The Rice IPM Program Committee solicits grant proposals each year from counties with rice acreage, awards funding according to level of effort and quality of the proposal and reviews the annual report from each Rice IPM county for the previous year. Grant funds support Rice IPM related travel, Rice IPM specific equipment items, Rice IPM newsletter printing, distribution costs, and other expenses.

Extension Program Results and Accomplishments

Output Indicators

22	Number of Rice IPM County Programs.
36	Grower meetings in Arkansas featuring Rice IPM.
780,000	Rice production acres represented by stakeholders at education meetings.
2,340	Stakeholders attending meetings/field days with IPM featured.
247	Field demonstrations funded by the Rice IPM program.
14	Field meetings, field days and workshops featuring Rice IPM.
107	Crop newsletters featuring Rice IPM.
6,683	Stakeholders receiving newsletters featuring Rice IPM.
913,256	Rice production acres represented by stakeholders receiving newsletters.
193	Popular press articles, radio spots, and interviews featuring Rice IPM.
592,345	Rice acres soil-sampled in Rice IPM counties.
741,200	Rice DD50 acres in Rice IPM counties.

1,140	Rice acres enrolled in 4-H Rice for Ducks program in Rice IPM counties.
1,154,000	Rice acres harvested in Rice IPM Counties.
1,555,000	Total rice acres harvested in Arkansas during 2004.
6,910	Bu/A record yield harvested in Arkansas during 2004.
40	Percent of rice acres treated in 2004 with fungicides.
19	Percent of rice acres treated in 2003 with insecticides.
100	Percent of rice acres treated in 2003 with herbicides.

Outcome Indicators

- Number of counties participating in the Rice IPM program average 20-25 each year.
- Rice DD50 and soil sampling acreage increased.
- Education efforts increased slightly in 2004.
- Total acres treated with fungicides decreased slightly in 2004 with rate per acre unchanged.
- Total acres treated with insecticides decreased in 2004.
- Use of flood depth to control rice blast was again a major blast control measure in the state.

Source of Funds

IPM (federal) administered by University of Arkansas Cooperative Extension Service, Dr. Gus Lorenz, coordinator.

Scope of Impact

Dissemination – The Rice IPM program is available to any county with rice production in Arkansas on a grant basis. County staff applies for grant funds and implement the local Rice IPM education program for the benefit of all persons in their respective counties.

Relevant publications for the program at the state level include the MP44 *Weed Control Handbook*, MP144 *Insect Control Handbook*, MP154 *Plant Disease Control Product Guide for Arkansas*, MP192 *Rice Production Handbook*, and *Arkansas Rice, a seasonal*

electronic newsletter (University of Arkansas Cooperative Extension Service, Plant Pathology Department, Fayetteville, Arkansas).

Scope of Program – The following counties were awarded Rice IPM grants for local education programs: Arkansas, Ashley, Chicot, Clay, Craighead, Crittenden, Cross, Desha, Faulkner, Jackson, Lafayette, Lawrence, Lincoln, Lonoke, Mississippi, Monroe, Poinsett, Prairie, St. Francis, White, Woodruff and Yell. These 22 counties include the largest rice production counties in the state and represent more than 75 percent of the total rice acreage in Arkansas.

Program Response:

Soybean Integrated Pest Management

Contact: Gus Lorenz, Extension Entomologist/ IPM Coordinator, Pest Management, 501-671-2191, or Cliff Coker, Extension Plant Pathologist, Pest Management, 870-460-1091

Situation

Soybean production in Arkansas was 124,425,000 bushels on 3.15 million acres, one of our largest crop in recent history. The average yield of 39.5 bushels per acre is now the highest recorded average yield, and bumps Arkansas' ranking above the 2002 level of ninth largest soybean-producing state in the U.S. Soybeans are produced in 42 of the 75 counties in Arkansas.

Since soybean is an intensively managed crop – requiring timely irrigation, fertilizer and pesticides applications. IPM is a necessary and natural tool to help producers farm more efficiently while reducing pesticide risk to the soybean ecosystem. Increasing special problems in eastern Arkansas crop production including decreasing soil and water quality, herbicide drift and resistance issues, increased insect pressure, increased production of pesticide-sensitive fish farms in the area, new pests, increased severity of established pests, and others have also increased the need for IPM in soybean.

The Soybean IPM education program was initiated in 1999 as an effort to teach producers how to better manage soybean using methods that increase production efficiency while reducing unnecessary inputs, including pesticides – and also to improve basic producer knowledge of the agro-ecosystem of which they are stewards.

Stakeholder Input

For several years, the Arkansas Farm Bureau has identified soybean pest control as a high priority. The Soybean Promotion Board has identified disease, insect and weed research as high priorities and has funded numerous grant proposals in these areas. County agent surveys have disclosed an increased need for clientele to determine “Best Management Practices” for control of soybean pest problems. With low commodity prices and the advent of transgenic soybean production, growers are faced with many difficult decisions on economic management practices.

Overview

The Soybean IPM education program was initiated in 1999 as an effort to teach producers how to better manage soybean using methods that increase production efficiency while reducing unnecessary inputs, including pesticides – and also to improve basic producer knowledge of the agro-ecosystem of which they are stewards. While the soybean IPM program has made significant educational progress in its brief existence, much remains to

be done in Arkansas. Pest management on Arkansas soybean farms still relies too heavily on preventative applications of herbicides. From 1.5 to 3 pounds a.i. of various herbicides are applied to every acre of soybean production in the state each year, and this number has decreased 5.0 pounds a.i. applied per acre since the peak of modern soybean herbicides in the 1980s. On the other hand, management of insects and diseases in the state relies more heavily on scouting and decision thresholds for the judicious use of insecticides and fungicides. Most acreage receives none of the latter pesticides, because many farmers have come to rely on resistant varieties or “Best Farming Practices” to minimize disease and insect threats. Nevertheless, overall usage of these pesticides – especially herbicides – could be even more judicious, resulting in further declines in applied materials. The increased use of Round-Up tolerant soybeans has reduced rates of many herbicides to control weeds in Arkansas, and has contributed significantly to a decrease in the widespread usage of metribuzin, alachlor and trifluralin herbicides on soybean in the state the past five years.

Extension Program Results and Accomplishments

Output Indicators

- Participation included 18 top soybean counties, representing 63% of Arkansas soybean acreage with 85% of this acreage implementing IPM practices.
- Soybean meetings featuring IPM totaled 61 during 2004.
- Meeting attendance was 2,136 soybean producers, about 40% of Arkansas soybean farmers of which 85% implement IPM practices.
- Participating county agents conducted 110 field demonstrations related to integrated pest management of soybean, including:
 - Balanced soybean fertility and effect on yield and pest severity (9).
 - Effect of proper irrigation on soybean productivity and disease management (7).
 - Multiple management approaches to weed control in soybean (20).
 - Use of lower rates of seed treatments to evaluate seedling disease management.
 - Appropriate use of fungicides to minimize foliar disease (10).
 - Use of disease resistance in soybean production in Arkansas (35).
 - Nematode sampling to identify and improve nematode management in problem fields (9).

- Reduced use of pesticides through scouting and decision thresholds (21).
- Monitoring soybean leaf beetles and stink bugs in soybean (16).

Program Impact

- Participating counties held 49 workshops or field tours featuring IPM, with 1,601 attendees.
- County participants wrote or distributed 92 newsletters on soybean and soybean IPM, with 4,068 growers receiving each of them.
- Soybean IPM topics were featured in 133 popular press items among the participating counties, including radio and TV programs and newspaper articles.
- Participating counties reported that only 10% of the soybean producers use private consultants on 10 % of the acreage.
- Participating counties reported pesticides use on their acreage as 57% received a seed treatment, 15 % received a foliar fungicide, 50 % received an insecticide and 100 % of their acreage received 1.4 applications of a herbicide.
- Because IPM relies heavily on highly specific information and soil fertility influences the severity of several soybean diseases and other pests, the Soybean IPM program encourages the use of scientific soil testing programs. Participating counties reported 4,603 soybean soil samples collected and analyzed by the University of Arkansas, representing 180,351 acres. This is critical information since soybean soil fertility values have gradually decreased in the state – increasing a plant’s susceptibility to diseases and other yield-limiting soil related problems.
- Participating counties reported at least 2,795 private and 1,052 commercial pesticide applicators received IPM training.
- Participating counties also reported using the pest management tools
 - nematode sampling: 118 fields covering 8,063 acres and
 - soybean variety selection computer program – SOYVA: 1,372 fields for 148,369 acres. This program provides better variety choices based on nematode and disease problems as well as herbicide tolerance.

Source of Funds

Smith-Lever 3(d) IPM funds, grants (Arkansas Soybean Promotion Board), gifts (various crop protection companies), and FSL-CES.

Scope of Impact

Dissemination The soybean IPM program is available statewide to all counties through “hands-on” presentations, training and field days. IPM meetings held in nine counties, field calls and visits, printed publications and the Extension web site.

Scope of Program – Soybean IPM presentations were made in every major soybean producing county. Soybean IPM field demonstrations were installed in 19 counties during 2004. Soybean IPM county participation has held steady at 18 counties with \$18,000 distributed in county IPM grants.

Program Response: Urban Pest Management Program

Contact: John D. Hopkins, Extension Entomologist, Urban, 501-671-2232, Pest Management

Situation

The scope of Urban Integrated Pest Management in Arkansas is very diverse, involving insect pests that can directly impact all citizens of the state. These insect pests pose both direct and indirect threats to human health and well-being, as well as having the potential to adversely impact the value of property the general quality of life of all Arkansans.

The Urban Integrated Pest Management program focuses on education of homeowners, agriculturists, youth, the professional pest control industry, the professional landscape and nursery industry, the professional turfgrass industry, Pest Control Section personnel of the Arkansas State Plant Board, members of the Arkansas Department of Health, and personnel of the Arkansas Department of Education in the area of Urban Pest Management. Program goals are achieved through county and state educational programs such as demonstrations, applied research, education booths, organized abatement demonstrations, presentations, publications, newsletters, web pages, in-service training of county faculty, and news releases.

Currently, there is no specific program promoting integrated pest management (IPM) in Arkansas public schools. Survey results from Alabama, Florida, Nebraska, North Carolina, and Pennsylvania indicate that most schools rely on pesticide applications to manage their pest problems. The U.S. Environmental Protection Agency promotes School IPM programs as a means to protect human health by suppressing pests that vector diseases, reduce losses from pest damage, reduce environmental pollution, and

reduce human exposure to pesticides. If Arkansans are to benefit from the positive aspects of IPM in the public school environment, a survey to assess current pest control measures and awareness of integrated pest management in the state public schools is necessary.

The need for a complete update of educational and training materials for individuals trying to become certified commercial and non-commercial pesticide applicators in the areas of “Termite & Structural Pest Control,” “Household Pest and Rodent Control,” “Food Manufacturing, Processing, and Storage Pest Control,” “General Fumigation,” “Food Related Fumigation,” “Ornamental, Tree, and Turf Pest Control,” “Weed Control,” and “Golf Course Pest Control” was identified, and cooperative work with the Arkansas State Plant Board to address this problem is ongoing.

West Nile Virus (WNV), a mosquito-borne arbovirus introduced to the western hemisphere during the summer of 1999, is now established all across the continental U.S. The number of human cases of WNV peaked at 42 in Arkansas during 2002 with 5 deaths recorded. In 2003, following the initiation of the education program on mosquito control and mosquito-borne disease prevention conducted by Extension Urban Entomology, county programs, and the Arkansas Department of Health, the human cases of West Nile fever/encephalitis dropped to 26 with no deaths recorded. Cooperative educational efforts with the Arkansas Department of Health were continued in 2004. The continued occurrence of human WNV cases indicates that the disease still poses a health threat to the state and continued educational efforts are warranted.

The greatest financial investment for most Arkansans is that of purchasing a home, and damage resulting from termite infestation is a concern, not only for homeowners but for all who own structural property. In addition to the native species that threaten the property of Arkansans, a new invasive species of termite, *Coptotermes formosanus* (Formosan subterranean termite), has the potential to cause damage in Arkansas. This species has yet to be identified in Arkansas; however, its distribution in the United States includes Alabama, California, Florida, Georgia, Hawaii, Louisiana, Mississippi, North and South Carolina, Tennessee, and Texas. This termite’s spread to Arkansas is felt to be only a matter of time. It will be highly beneficial to slow or prevent the spread of the Formosan subterranean termite to Arkansas, and educational efforts to increase awareness of this potential threat are needed.

The management of pest problems associated with the urban environment is critical to the health and well-being of all Arkansans. The Urban Integrated Pest Management program was developed in 2002 to focus programs toward protecting the health and property of the citizens of Arkansas. These programs involve using innovative methods to educate, detect, and protect Arkansans from threatening pest species.

Stakeholder Input

The Arkansas State Plant Board identified a need to update educational and training materials for individuals seeking commercial/non-commercial pesticide applicator certification in the areas of “Termite & Structural Pest Control,” “Household Pest and Rodent Control,” “Food Manufacturing, Processing, and Storage Pest Control,” “General

Fumigation,” “Food Related Fumigation,” “Ornamental, Tree, and Turf Pest Control,” “Weed Control,” and “Golf Course Pest Control.”

The Arkansas Department of Health has indicated a continuing need for cooperative educational efforts to inform Arkansans about the threat posed by mosquito-borne diseases and protective measures that should be taken.

The Arkansas Department of Education has expressed support of the Extension Urban Entomology program to assess pest control practices in Arkansas public schools and to promote the implementation of a voluntary “School Integrated Pest Management Program.”

Overview

During 2003-2004, cooperative work to produce educational materials for commercial pest control professionals was conducted between Extension Urban Entomology and the Arkansas State Plant Board through the support of a Professional Applicator Training Materials Grant sponsored by EPA and administered by the Arkansas State Plant Board. Miscellaneous Publications produced were MP441, *Termite and Other Structural Pest Control (Commercial)*; MP442, *Household Pest and Rodent Control (Commercial)*; MP443, *Food Manufacturing, Processing, and Storage Pest Control (Commercial)*; MP444, *Ornamental Tree and Turf Pest Control (Commercial and Non-Commercial)*; MP445, *Golf Course Pest Control (Commercial and Non-Commercial)*; and MP446, *Weed Control (Commercial) and Ornamental Weed Control (Non-Commercial)*. The training manual for "General Fumigation (Commercial) and Food Related Fumigation (Commercial)" is currently in development. This project addressed a significant need in Arkansas for updated and improved training material for commercial pest management professionals requiring licensing by the Arkansas State Plant Board and demonstrates a cooperative interdisciplinary approach (Extension Entomology, Plant Pathology, Weed Science, and Wildlife Biology) toward accomplishing the project goals. Support to counties and the commercial pest management industry was provided through in-service training, various county meetings, and interactions with commercial pest management professionals.

In 2004, grant support was sought to initiate a “School IPM Program” within the state of Arkansas. This effort was successful with the winning of a competitive grant supported through the Southern Region Integrated Pest Management Center with funds from the USDA/CSREES’s Integrated Research, Education and Extension Competitive Grants Program - Integrated Pest Management. This initial 1 year grant (\$24,168.00) will support a “Survey of Pest Management Practices in Arkansas Schools.”

The Urban Entomology Program also concentrated on continued awareness education regarding mosquito management and mosquito-borne disease prevention. The relationship with the Arkansas Department of Health continued with opportunities to

provide training to Health Department personnel and the citizens of Arkansas through the annual West Nile Virus Media Briefing. In addition, the Urban Entomology Program provided educational materials to county programs to further the education of Extension clientele in individual and community mosquito control efforts and mosquito-borne disease prevention. During 2002 there were 43 human cases of West Nile fever/encephalitis with 5 deaths. In 2003, following the initiation of the education program on mosquito control and mosquito-borne disease prevention conducted by Extension Urban Entomology, county programs, and the Arkansas Department of Health, and with the financial support afforded to county governments by the Governor of Arkansas, the human cases of West Nile fever/encephalitis dropped to 26 with no deaths attributed to West Nile virus infection. With the efforts in 2004, the trend toward lowering the incidence of human West Nile fever/encephalitis cases has continued. Currently, 2004 human West Nile fever/encephalitis cases stand at 28 with no deaths.

Fire ant control demonstrations involving mound and broadcast applications of commercial products were conducted in Pulaski and Miller counties with the assistance of Allen Beurman, county Extension agent - agriculture, and Doug Petty, county Extension agent - staff chair, respectively. Work on fire ant biological control demonstrations in cooperation with USDA-APHIS, Loftin, Shanklin, John Gavin, Bradley County Extension agent - staff chair, and Mike McCarter, Pike County Extension agent - staff chair, continued. Indications are that the fire ant parasite, *Pseudacteon tricuspidis*, released in Pike Co. in 2002, has successfully established a reproducing population and continues in 2004 to expand outward from the area of initial release.

The Urban Entomology Program provided support to Extension Horticulture through the conduct of numerous county Master Gardener educational opportunities and through collaborative efforts to provide training to commercial landscape and nursery personnel.

Youth and 4-H support was accomplished through involvement with judging and exhibiting youth insect collections at the 4-H O-Ramas, the Mid-South Fair, and the Arkansas State Fair. The responsibility for conducting the Arkansas Bug Bowl/4-H Linnaean Games and participating in the Regional (AR, TN, MS, MO, KY) 4-H Linnaean Games was assumed in 2004. Five Junior Division Teams and two Senior Division Teams competed at the Arkansas Bug Bowl, and the top 3 teams from each division competed at the regional level held at the 2004 Mid-South Fair in Memphis, Tennessee.

County Extension support and support to the citizens of Arkansas was also accomplished by providing on demand insect specimen identification and control recommendations relating to Urban Pest Management, by updating appropriate sections of MP144, *2004 Insecticide Recommendations for Arkansas*, and through various other publications/presentations, and support materials.

Extension Program Results and Accomplishments

Output Indicators

- 1,550 individuals attending presentations.
- 405 contacts from individuals seeking pest information.
- 25 presentations at educational meetings.
- 13 press articles or media interviews.
- 15 Major Extension publications.
- 6 Presentations at professional meetings.
- 8 youth outreach educational activities.

Program Impact

- Number of human WNV cases remains below peak levels of 2002.
- Awareness of the impact of subterranean termites and the potential threat from new invasive termite species increased.
- Preliminary assessments of pest control methods and IPM awareness in Arkansas public schools indicates that there is a desire for learning more about a voluntary School IPM Program among a majority of survey respondents.

Source of Funds

Federal Smith-Lever – CES.

Scope of Impact

Dissemination – Urban IPM programs are available to all counties where a need exists to manage pests in a more efficient way.

Scope of Program – All 75 counties have implemented mosquito educational programs. Through publications and training, counties have implemented very successful programs and are excellent contacts for program development consultation.

A majority of Arkansas counties have delivered the urban pest management program via ongoing county educational opportunities.

The Arkansas State Plant Board is currently utilizing the updated Extension produced training materials with all potential applicators in the commercial pest control industry.

<p>KEY THEME: NATURAL RESOURCE MANAGEMENT</p>

Program Response:
Forestry Continuing Education

Contact: Caroll Guffey, Extension Instructor and Director Continuing Education, 870-460-1549, Arkansas Forest Resources Center

Situation

A continuing education program for forestry professionals was created in 1993 through support from the Arkansas Forest Resources Center. Other states were conducting continuing education programs and the Center wanted to investigate the potential for an Arkansas-based continuing education program. The program received an additional boost in 1999 when the Registered Foresters Law was strengthened. Under legislation passed in 1999, all individuals referring to themselves as foresters and providing assistance to private forest landowners must be registered with the Board of Registered Foresters. Statewide, there are approximately 900 Registered Foresters. Each must complete 6 hours of Continuing Education a year to remain registered. The Forestry Continuing Education program works to fulfill these educational requirements of foresters in particular and all other professionals in general. The program also delivers education to other professionals including attorneys, accountants, natural resource managers, county agents, landowners, and other Extension professionals.

Stakeholder Input

Input into the Forestry Continuing Education program is derived directly from the Continuing Education advisory board comprised of registered foresters, University faculty, private forest landowners, and other natural resource professionals. Members include representatives from the UA Cooperative Extension Service, School of Forest Resources, Arkansas Forestry Association, Arkansas Forestry Commission, Arkansas Game and Fish Commission, Natural Resource Conservation Service, The Timber Company, International Paper Company, Potlatch Corporation, Consulting Foresters, The Nature Conservancy, US Forest Service and a private non-industrial forest landowner. The group meets annually.

Input is also received from the Arkansas Forest Resources Center advisory board, county agents, Arkansas Forestry Commission, and other partner agencies via various meeting, direct contact, and planning meetings.

Overview

The Forestry Continuing Education program, although originated to serve registered foresters, facilitates workshops and short-courses covering a wide array of topics. Topics covered in the Continuing Education short courses include Global Information Systems applications in forestry, timber cruising, wildlife management, pine plantation management, upland oak ecology symposium, and prescribed fire. Future topics include property law, Best Management Practices, presentations and business communications, and advanced GIS applications. Workshops are from 1 to 4 days long depending upon the course material. For example, the Prescribed Fire short-course is a four day intensive field-based course.

In addition to sponsoring continuing education for natural resource professionals, the director has helped with other programs designed for forest landowners including the U.S.Forest Service Crossett Forestry Field Day.

Extension Program Results and Accomplishments

Output Indicators

- 250 Number of registered foresters, forest landowners, industry, and/or agency personnel attending educational programs.
- 8 Number of educational meetings held with forestry industry representatives, State and federal agency personnel, and UA Cooperative Extension faculty to identify forest continuing education issues and plan programs.
- 12 Number of continuing education programs conducted.

Outcome Indicators

- 355 Number of participants maintaining registered forester status.

Source of Funds

Smith-Lever 3b and 3c and the Arkansas Forest Resources Center.

Scope of Impact

Dissemination – Program is available statewide to all interested professionals including county and state UA faculty. The Arkansas State Board of Registered Foresters recognizes this program as being the primary resource for forestry professionals to receive Continuing Education Credits.

Program Response:

Natural Resources Public Policy Education

Contact: Janie Simms Hipp, J.D., LL.M., 479-575-6935, Environment and Natural Resources; Tom Riley, Extension Specialist – Environmental Policy, 501-671-2080, triley@uaex

Situation

Rapid change in federal, state and local public policies affecting agriculture and natural resources is occurring. Many Arkansans whose lives are directly affected by agriculture and natural resources policies generally are under-informed concerning the intricacies of those policies, and therefore, are less equipped with the knowledge necessary to ensure proper compliance. Knowledge of state, regional and national regulatory policy and the developing judicial interpretations of those policies is key to the healthy and prosperous survival of those whose lives and livelihoods are connected with Arkansas land, water and other natural resources. Through a knowledgeable, educated and informed general public and regulatory community, public conflicts between those affected by natural resource policy changes will be lessened. By focusing on education and prevention instead of litigation and conflict, we will bring about faster compliance within policy frameworks, more efficient and effective means for achieving desired regulatory results, and at the same time encourage a more knowledgeable public and consumer base. Increased responsibility will flow from increased education and positive solutions to public policy challenges will be realized.

Stakeholder Input

As project partners in the activities involved in this program response area, the Arkansas Soil and Water Conservation Commission, the Arkansas Department of Environmental Quality and the Arkansas State Plant Board review program activities. As this new program response area matures, we will bring more definition to the process by which stakeholder input is solicited, incorporated and reported. Additional non-funding partners include the Arkansas Forestry Commission, the Livestock and Poultry Commission and the office of the Governor. Informal input into program design has also been received from the Arkansas Farm Bureau and the University of Arkansas Little Rock School of Law. Stakeholder input will be designed to ensure that specific suggestions on the most important issues facing the agricultural production community and the rural community at large that are of a legal and regulatory nature are solicited.

Overview

The University of Arkansas Division of Agriculture has partnered with key state agencies in providing funding for a Natural Resource Public Policy Education program. This program is housed within CES with support from the Dale Bumpers College of Agricultural, Food and Life Sciences, and the Department of Agricultural Economics and Agribusiness. In 2004 we continue delivery of a public policy education program in coordination with other funding state partners: the Arkansas Soil and Water Conservation Commission, the Arkansas State Plant Board, the Arkansas Forestry Commission and the Arkansas Department of Environmental Quality. Envisioned project tasks include training, preparation of educational materials, and conducting public meetings on substantive issues. The program will substantively address such legal and regulatory issues as water quality and quantity, environmental and natural resource regulation, private landowner liability, the advantage of public/private relationships in enhancing our natural resource base, the role of private entities such as cooperatives or conservation districts in protecting and enhancing natural resources, the necessities of planning for and assessing actual risks to natural resources, and the impact of regulatory change. A recent new partner in this effort is the University of Arkansas at Little Rock School of Law. A statewide water conference was coordinated in November, 2004, culminating a broad inter-agency effort which included participation of one of the state's law schools. The water conference will be an annual event and will discuss and offer educational updates concerning developing water rights and water quality, legal and scientific issues and will provide an educational venue to identify alternatives and consequences associated with the water challenges facing the state. Ongoing instruction of the agricultural law undergraduate class at the University of Arkansas Fayetteville occurs. Additional public policy program efforts have been funded as part of a larger grant effort secured both by the public policy regulatory specialist and as a part of a larger team working on natural resource issues. These and other types of program activities will continue as the program develops.

Extension Program Results and Accomplishments

Output Indicators

Fact sheets concerning landowner liability for entrants onto land and description of and effect of new animal waste statutes passed by the Arkansas General Assembly, with posters accompanying those fact sheets. Additional, with regard to the landowner liability issue, an article appeared in the publication *Forest Landowner*, and two discussions of these issues have occurred at the University of Arkansas at Pine Bluff annual Rural Life Conference events.

Outcome Indicators

Our efforts are to increase the knowledge base for those persons affected by changing uses of land for recreational access and income producing purposes. Additional calls and inquiries have resulted from the production of the written fact sheet that specifically discusses the landowners' liability exposure and makes recommendations concerning actions that can be taken to prevent problems with entrants onto the land. With regard to the animal waste statutes fact sheet, a large number of producers and affected citizens have been attending and providing input to the regulatory process as those statutes are put in place and the regulatory public hearing process has developed.

Source of Funds

Funding for the Natural Resource Regulatory Policy Specialist is provided from a partnership agreement with the Arkansas Soil and Water Conservation Commission, the Arkansas State Plant Board and the Arkansas Department of Environmental Quality, in conjunction with CES and the University of Arkansas Division of Agriculture.

Scope of Impact

Dissemination – Water quality regulatory publications and landowner liability publications are available via county Extension offices and through the UAEX web site. Programs are available statewide and program efforts are available statewide.

Scope of Program – Producers living in the western two-thirds of the state were the primary recipients of early program educational material concerning animal waste regulation. The landowner liability educational materials serve producers from all areas of the state. The water conference in planning stages will be a statewide effort.

<p>KEY THEME: RECYCLING</p>

Program Response: Solid Waste Management (Including Recycling and Yard Waste/Composting)

Contact: Suzanne Smith Hirrel, Extension Specialist - Waste Management, 501-671-2288, shirrel@uaex.edu, Environmental and Natural Resources

Situation

Agricultural producers are faced with disposal of solid waste that is generated on the farm. Rural communities are also faced with solid waste disposal issues. Illegal dumping, burning of solid waste and littering, which are health and safety problems, are common disposal practices. Landfill disposal fees continue to rise.

Stakeholder Input

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.

Overview

Arkansas generates approximately 4 million tons of solid waste annually, over ton per person each year. The state has a limited number of disposal sites or landfills (23 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. In 2002, 1.39 million tons were recycled, a recycling rate of 34 percent. Improper disposal of solid waste is a health and safety problem and a detriment to economic development.

Extension Program Results and Accomplishments

Output Indicators

- 40 Number of educational meetings, workshops, demonstrations (sites or exhibits), news articles, radio programs and tours help to educate clientele about the benefits and how-to of composting (backyard, on-farm and municipal).
- 17 Number of 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).
- 16 Number of educational meetings, workshops, news articles, radio and TV programs, demonstrations and tours held to educate clientele about disposal, recycling and composting opportunities for on-farm generated waste (plastic irrigation pipe, pesticide containers and used motor oil).
- 3 Number of 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.
- 1,788 Number of clientele attending educational programs and receiving educational

publications and other materials written and/or distributed on solid waste management.

Outcome Indicators

35 Number of clientele who reported changing their solid waste management practices.

13,846,382 Number of pounds of plastic irrigation pipe collected for recycling.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Statewide availability of program to interested counties. Recycling, composting (fact sheets available), source reduction, buying recycled and household chemical recycling information is available on the UAEX web site.

KEY THEME: WATER QUALITY

Program Response:

Water Quality and Watershed Education

Contact: Mike Daniels Extension Specialist – Environmental Management, 501-671-2281, mdaniels@uaex.edu

Situation

The United States Environmental Protection Agency (EPA) has identified agriculture as a major source of water quality impairments of our nation's lakes and streams. Both EPA and the United States Department of Agriculture (USDA) have promoted a voluntary watershed approach to address nonpoint source pollution from agricultural sources.

The State of Arkansas has identified seven priority watersheds in need of voluntary restoration efforts to address runoff from agricultural land. Watershed-specific education will become increasingly important to our clientele. Several streams in Eastern Arkansas

are slated for sediment-based TMDLs as ordered by a Consent Decree from the Federal Courts.

Hundreds of Arkansas poultry producers will be classified as a Concentrated Animal Feeding Operation (CAFO) and will have to comply with federal rules such as obtaining a NPDES permit, which will govern effluent discharge from these operations. Also Arkansas Acts 1059, 1060, and 1061 will regulate the utilization of poultry litter and other nutrients in nutrient sensitive watersheds as declared by the Arkansas General Assembly. In these watersheds, landowners who apply nitrogen or phosphorus will have to obtain a nutrient management plan that is prepared by a State-certified planner and will have to be State-certified to apply nutrients.

Stakeholder Input

- County Extension Councils,
- non-profit watershed organizations (Bayou Bartholomew Alliance, the Beaver Lake Partnership, the Lower Little River Watershed Coalition, etc.),
- the Arkansas Soil and Water Commission,
- the Arkansas Department of Environmental Quality,
- the Natural Resources Conservation Service,
- The Arkansas Association of Conservation Districts,
- local conservation districts,
- local watershed steering committees (organized by Extension as part of watershed projects),
- agricultural producer organizations,
- Arkansas Farm Bureau,
- the Arkansas Conservation Partnership,
- the Arkansas Watershed Advisory Group,
- EPA, USDA.

- Several actions are taken to seek stakeholder input:
 - Project plans are reviewed by the Arkansas Soil and Water Conservation Commission and EPA.
 - All of our watershed projects are done in conjunction with formal and informal partners who give us valuable input.
 - Program plans are shared with County Extension Councils and input gathered.
 - In many watersheds, we have formed local watershed advisory committees who work with us to develop and implement plans. One advantage of this approach is the transfer of ownership from Extension to local stakeholders after the project funding ends.
 - We have worked with non-profit organizations to help them assess their needs and actions in addressing water quality issues. In the process, we gain valuable input.
 - We serve on several federal, state and ad hoc committees in other agencies and organizations, which has resulted in much input.
 - On grant-funded watershed projects, we almost always conduct a formal survey of landowners to gain their input and perceptions

The steering committee of watershed stakeholders has assisted greatly with targeting groups for these educational efforts. Also, many public meetings and forums that have been sponsored by Extension have led to the identification of individual and groups.

All of this input has been considered and has helped us in the design, implementation, and evaluation of these educational programs.

Overview

We have completed four EPA-funded watershed education projects and are currently concluding two CSREES funded projects (see below):

- Watershed: 406 Regional watershed Funding (Fed. Only): \$70,000 per year for 4 years
 Location: Statewide
 Status: In fourth of fourth year
 Issue/Extension Response: This grant helps us coordinate programs with 12 other southern states and helps us to conduct programming where watershed specific funds are not available.
- Watershed: Ballard Creek
 Funding (Fed. Only): \$300,000 for 3 years
 Location: Washington County
 Status: Completed. Final Report issued in August 2003
 Issue/Extension Response: Phosphorus/Promote proper animal waste management, pasture management, and soil testing as well nutrient management planning to

reduce soil phosphorus levels and soluble P in runoff.

- Watershed: White River
Funding (Fed. Only): \$150,000 for 3 years
Location: Washington and Madison counties
Status: Completed. Final Report issued in October 2003
Issue/Extension Response: Sediment/Promote agricultural and land management practices that reduce sediment loss such as improved pasture management.
- Watershed: Lower Little
Funding (Fed. Only): \$240,000
Location: Hempstead, Little River, Sevier and Howard counties
Status: Completed. Final Report issued in December 2004.
Issue/Extension Response: General Protection of drinking water supply/Create public awareness of need to protect water quality, youth education and environmental training for livestock producers.
- Watershed: Bayou Bartholomew Incremental Funding
Funding (Fed. Only): \$75,000 for 2 years
Location: Jefferson, Lincoln, Drew and Ashley counties
Status: Completed. Final Report issued in July 2003
Issue/Extension Response: Turbidity (Suspended Sediment)/Promote the use of conservation tillage to reduce sediment loss from cotton production by implementing a conservation mentor farmer program.
- Watershed: Mud Creek II
Funding (Fed. Only): \$117,667
Location: Washington County
Status: Initiated in FY2000
Issue/Extension Response: Urban nonpoint source pollution/Promote proper lawn care, disposal of hazardous household wastes to homeowners using Home*A*Sys.
- Watershed: Addressing Phosphorus Concerns in Northwest Arkansas
Funding (Fed. Only):
Location: Washington, Benton, Carroll, and Madison Counties
Status: Initiated in FY2001
Issue/Extension Response: Reducing phosphorus from livestock farms in Northwest Arkansas/Nutrient management planning education.

As these watershed projects have been completed, we are now taking a more issue-targeted approach involving two new programs that are being developed in FY04 to be delivered statewide. To help our clientele better address water quality and environmental issues, we will be launching the Arkansas Master Farmer Program. This program will

provide training to agricultural producers on environmental policy, new conservation technology, best management practices, and natural resource concerns.

Secondly, to assist livestock producers to deal with new State and Federal regulations, we will launch a new EPA 319h project (\$819,000 federal dollars) to provide nutrient management certification training and nutrient applicator certification training.

Extension Program Results and Accomplishments

Output Indicators

- 276 Number of educational events (i.e., meetings, demonstrations, farm visits, consultations, field days, etc.) held to educate clientele on best management practices to lessen the agricultural impacts and urban nonpoint source impacts on surface water quality and watershed issues.

- 1,300 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 nonpoint source pollution as well as watershed issues.

Source of Funds

Smith-Lever, EPA, and USDA-CSREES.

Scope of Impact

Dissemination – Program is delivered statewide; however, more intensive efforts are made in the counties that have funded watershed projects. The statewide dissemination is through local county offices with support from specialists. In these watershed projects, delivery is tailored to the specific needs and issues of the respected watershed. Each project funds dedicated Extension personnel that are housed locally within the watershed. In some cases, educational products developed for the watershed projects are delivered statewide. Several oral presentations were made around the state. Several oral and poster presentations were made at three national meetings and two regional meetings. Two refereed journal articles were published along with 15 abstracts and proceedings articles.

Scope of Program – Educational events were conducted to address agricultural and urban water quality issues statewide. Educational materials were developed and were disseminated in all counties. In all agricultural watershed projects, Extension either founded a local watershed steering committee or provided technical and educational advisory to nonprofit watershed organizations. The regional 406 watershed management grant has allowed us to conduct programming with the other 12 southern states (North Carolina, South Carolina, Florida, Georgia, Tennessee, Kentucky, Alabama, Mississippi, Louisiana, Texas, Oklahoma and New Mexico).

<p>KEY THEME: WILDLIFE MANAGEMENT</p>

Program Response:

Wildlife Management on Private Lands

Contact: Rebecca McPeake, Environmental and Natural Resources Section, 501-671-2285, rmcpeake@uaex.edu; Rex Roberg, Environmental and Natural Resources Section, 501-671-2334, rroberg@uaex.edu; Leslie Gall, Family, Youth, and 4-H Section, 501-821-6884, lgall@uaex.edu

Situation

Arkansas is home to abundant wildlife that thrive in cities, suburban backyards and rural countrysides. An estimated 52 percent of all Arkansans participated in wildlife-related activities (calculated from 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation and population estimates from the U.S. Bureau of the Census). In 2001, residents and visitors spent \$1.3 billion on wildlife recreation in Arkansas (2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation). Wildlife enterprises contribute significantly to some local economies, particularly those in the Delta waterfowl flyways. Conversely, wildlife abundance has contributed to landowner problems such as destruction of gardens and landscape plantings, increased incidence of deer-related vehicle accidents, lowered agricultural crop production, and bird depredation at aquaculture facilities, to name a few.

A combination of abundant wildlife and public interest in wildlife has created a large demand for information about wildlife habitat enhancement and nuisance control on private lands. In Arkansas, nuisance wildlife species contribute an unknown but potentially substantial cost in property damage. For example, an estimated 10,000 deer-vehicle collisions occur annually. Information from commercial enterprises, regulatory state and federal wildlife agencies, academic faculty and private organizations is sometimes construed as biased by private landowners. Extension plays a vital role in linking landowners with options for enhancing habitat or addressing problem wildlife.

Stakeholder Input

Stakeholders include private non-farm landowners, row crop and livestock farmers, aquaculture operators, homeowners, hunters, anglers, wildlife watchers, youth, schoolteachers, 4-H volunteers, Master Gardeners and natural resource professionals. Stakeholder input was solicited through questionnaires distributed at forestry and wildlife workshops and conferences, commodity meetings, water quality meetings, Master Gardener training, youth contests and other natural resource meetings, and newsletters mailed to county landowner and natural resource professional mailing lists. Most stakeholders were identified through contacting county Extension offices with individual questions and in response to wildlife program promotional efforts in newspapers and radio announcements. Some stakeholders were identified through working with county Extension agents on agriculture production or related topics. Other stakeholders were identified through work with partnering agencies and organizations on wildlife projects. Programming needs were identified through county councils, stakeholder attendance and questionnaire responses at workshops, verbal and written feedback from county Extension agents about their needs.

The wildlife management program continually collects information from stakeholders through requests for information, input from county councils and program evaluations. This input is directly tied to program development. Many programs are developed based on needs expressed by county agents. For example, FY2004 represents the sixth year of the Wildlife Habitat Improvement Workshop. This program was developed through input

from a county agent and his informal conversations with farmers and landowners. He perceived a need for education about wildlife management practices for improving woodland habitat on private property. He enlisted surrounding county agents and called the wildlife specialist to form a multi-county workshop.

Feedback from stakeholders and county Extension agents is gathered using formal and non-formal means at presentations, workshops, seminars and in-service trainings. This includes evaluation forms, surveys and personal inquiries. Advisory/planning committees are formed for particular events, activities and projects. These committees are comprised of specialists, agents and volunteers representing stakeholder groups. We conduct a survey-based evaluation for each program delivered. This input is valuable in assessing whether the program met the clients' needs, the program's impact on attitudes and/or decisions and ideas for designing future programs. After sending a media release, newspapers are monitored and articles counted to assess educational impact.

Overview

The Wildlife Program addresses a range of stakeholder needs from those desiring more wildlife on their property to others who experience wildlife damage and want to reduce wildlife on their property. The Wildlife Program can be subdivided into four areas: Landowner Education Programs, 4-H Programs, Wildlife Policy and Education, and Applied Research.

- Landowner Education Programs assist county Extension agents (CEAs) in the development, implementation and evaluation of local county wildlife education programs. The Wildlife Program supports CEAs for conducting landowner education about wildlife habitat management through the Acres for Wildlife program, presentations at Master Gardener training and landowner meetings, Wildlife Habitat Improvement Workshops and development of new fact sheets about pertinent topics. A "Landowner Assistance Finder" is available on the intranet to provide information about technical and financial support through government and non-government agencies, including descriptions, eligibility requirements and procedures for enrolling in conservation incentive programs. Another focus area is diversified agriculture through wildlife enterprises. A web module is available (www.forestandrange.org) to assist landowners with making this decision through understanding wildlife management concepts and practices, conducting a habitat assessment, knowing the legal aspects, developing a marketing strategy, and designing a business plan. Fact sheets and posters about this topic have been developed and distributed.

Our future program direction for landowner education includes a program package about the 2002 Farm Bill conservation titles, additional fact sheets about wildlife habitat enhancement and wildlife damage control, assessing native seed production as an alternative enterprise, and finding ways to provide financial assistance for

counties to conduct forestry and wildlife programming.

- Youth education is an opportunity to educate future landowners, their parents and adult leaders about wildlife management. Details about program impacts can be found under Goal 5, Youth Development/4-H, Forestry and Wildlife Education. The 4-H Wildlife Habitat Evaluation Program teaches youth ecological principles, a variety of wildlife habitat management practices and basic life history for a variety of wildlife species in both urban and rural settings. 4-H Forestry and Wildlife Camp is a four-day educational experience designed for 11- to 13-year-old youth. The 4-H Grasslands Evaluation Program is a comprehensive pasturelands management training tool that several Extension faculty have used to train both adults and youth about livestock and wildlife management practices. NatureMapping ties together existing curricula and offers hands-on, experiential activities that are self-directed by participants and leaders. NatureMapping teaches science-based techniques for observation and data collection while providing youth the flexibility to shape their own projects.
- Wildlife and Policy Education addresses Extension representation for policies, regulations and issues that impact county Extension agents, producers and landowners. To ensure that this information is transferred to local county programs, county Extension agents are offered in-service training opportunities, fact sheets, reference literature for their county office, e-mail and personal contacts about local issues of concern. Extension continues to partner with the Arkansas Game and Fish Commission, as well as a number of non-profit wildlife organizations, in collecting and assessing stakeholder input that is used in program and policy decision-making.
- Applied Research focuses on answering wildlife-related questions offered by county Extension agents that currently are not being addressed through universities and other research entities. For accomplishing this program direction, we collaborate with university faculty or other agencies to conduct research/demonstration studies comparing native and non-native plants consumed by wildlife.

Extension Program Results and Accomplishments

Output Indicators

- 97 Number of educational meetings, workshops, demonstrations, displays/booths, and/or field days held to educate clientele on enhancing wildlife habitat, prevention and control of wildlife damage and wildlife enterprises.
- 10 Number of educational presentations through 4-H clubs and in schools to teach youth and 4-H leaders about wildlife identification, management and habitat practices.

- 39 Number of educational materials written and/or distributed (i.e., fact sheets, news releases, conference proceedings, newsletters, handouts, etc.).
- 1,233 Number of clientele participating in educational meetings, workshops and seminars.
- 1,458 Number of clientele receiving individualized training about wildlife management.

Outcome Indicators

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

Source of Funds

Smith-Lever, 50/50 cost-share partnership agreement with Arkansas Game and Fish Commission, RREA, and USDA EQIP – Education.

Scope of Impact

Dissemination – Information is available on the web and printed publications are available upon request.

Scope of Program – This program is available statewide to stakeholders and Extension faculty. Many of these programs can be conducted independently of the wildlife specialists and, therefore, their program activities are unknown to those developing this report. The fifty-seven counties served through FY2004 wildlife programs that are known to wildlife specialists are Washington, Madison, Newton, Searcy, Marion, Van Buren, Conway, Faulkner, Pope, Johnson, Yell, Logan, Sebastian, Perry, Pulaski, Saline, Garland, Polk, Sevier, Little River, Miller, Lafayette, Hempstead, Hot Spring, Nevada, Ouachita, Clark, Dallas, Union, Ashley, Bradley, Cleveland, Drew, Lincoln, Jefferson, Lonoke, Arkansas, Chicot, Desha, Phillips, Monroe, Lee, St. Francis, Crittenden, Poinsett, Craighead, Mississippi, Stone, Sharp, Independence, Fulton, Cleburne, White, Jackson, Grant, Union, and Prairie. These counties have requested information about wildlife management, conducted wildlife educational trainings, or developed workshops or demonstrations for farmers.

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

By definition, Arkansas is clearly a rural state. The 2000 Census indicates that at the national level, 21 percent of the population is considered rural, while in Arkansas 47.5 percent of the citizens live in places with less than 2,500 residents or outside of an urbanized area. While we are rural, we are growing. By 2005, it is projected Arkansas will be the 32nd most populous state with 3.1 million people.

Economic challenges are significant for many Arkansas communities and families. The future of rural Arkansas depends, to a large extent, on the types of jobs and sources of income in the area. Earnings per job is an important indicator of how well working families are doing.

- In 2000, Arkansas ranked 46th in the U.S. in earnings per wage and salary jobs.
- In 2002, rural workers averaged \$323 in weekly earnings compared to \$389 for urban workers. From 1990 to 2002, the overall increase in average earnings was \$29 per week for rural workers and \$46 for urban workers.
- Between 1996 and 2000, the average earnings per job across the U.S. increased 10.9 percent compared to 7.5 percent in Arkansas.

Arkansas' unemployment rate (November 2004) was 5.6 percent compared to a national rate of 5.4 percent.

Fourteen percent of the state's population is 65 years of age and older.

Fourteen percent of those 65 and over live in poverty.

- 2000 census figures report that Arkansas ranks 49th among the states in median household income.
- The Delta continues to have the lowest median household income among the rural regions in the state.

While the poverty rate declined between 1989 and 1999, Arkansas continued to have a high rate of poverty in 1999 (15.8 percent) as compared with the U.S. as a whole (12.4 percent). Despite the fact that poverty has become less persistent across Arkansas, rural Arkansans had a substantially higher rate of poverty (17.8 percent) than urban Arkansans (13.8 percent). The Delta had the highest poverty rate of 22.5 percent. Poverty among families with children is more prevalent in rural counties than urban counties. In 1999, 21 percent of rural families with children lived in poverty compared to 16 percent in urban

counties. The 2000 census figures report that 23.5 percent of Arkansas children under the age of 18, and 30 percent of Arkansas' children under five, live in poverty.

Cooperative Extension faculty and staff work collaboratively with local stakeholders to empower individuals, families, and communities, through research-based information and education, to address economic and social challenges facing our youth, families, and communities. Specific programs include leadership development including 4-H youth, community, and business leaders; family resource management; workforce preparation programs for youth; youth technology programs; programs which address planning for the long term; and programs which assist parents in improving their parenting skills.

Total FTEs

230.96

Total Budgetary Amount

\$7,884,719.98

KEY THEME:
CHILD CARE/DEPENDENT CARE

Program Response:

The Best Care: Best Care Connected

Contact: Traci A. Johnston, Child Care Program Associate, 2301 South University Avenue, P.O. Box 391, Little Rock, AR 72203, 501-671-2364; 501-672-2294 (fax), tjohnston@uaex.edu

Situation

The National Academy of Early Childhood Programs defines a high quality child care program as one that meets the needs of and promotes the physical, social, emotional, and cognitive development of the children and adults who are involved in the program. For Arkansas' child care to be of high quality, child care providers must understand and implement best practices that promote such development. This requires continued training and education. Providing necessary training to child care providers in all parts of Arkansas, including remote rural areas, is a considerable challenge.

Quality child care should be available to all families regardless of income or family structure. Unfortunately, in Arkansas quality care is inaccessible to many of the working poor. More than 1 in 4 (28%) Arkansas families is headed by a single parent who needs affordable child care in order to work. The need for child care is not limited to single parents. Nearly 2 out of every 3 (65%) Arkansas mothers with children under the age of five are in the workforce. Almost 3 in 4 children (72%) under the age of 6 live in families with both parents working. Over 70% of children 3-6 spend substantial amounts of time in non-parental care. Approximately 52% of children under three are in non-parental care. The demand for child care has increased in recent years, but the number of quality-approved programs has not kept pace.

In 2002, 309 of Arkansas' 3,211 licensed child care facilities have achieved a quality rating (Arkansas Kids Count, 2002). This means most of the 23,773 children served by these facilities do not enjoy the quality care desired. A number of challenges make

quality difficult to achieve. Pay in child care settings is typically low. The work is difficult and labor-intensive, and turnover among child care professionals is high. These conditions make it difficult to keep a well trained staff. And a trained, knowledgeable staff that interacts positively with children is the most important ingredient to achieving quality. Making effective research-based training available at times, locations and formats convenient to child care providers is essential to improving the quality of Arkansas child care.

Stakeholder Input

Understanding the needs of children, parents, caregivers and child care service organizations is critical to developing and implementing quality educational programs. The Cooperative Extension Service (CES) works closely with the Arkansas Division of Child Care and Early Childhood Education and the Arkansas Early Childhood Professional Development System to determine needs and effective solutions. To better understand the needs of child care providers, evaluation data is collected from two child care training programs. A “Best Care” advisory committee composed of subject matter specialists and county agents meets regularly to review evaluation data, discuss participant feedback, and assess current program needs.

Overview

The Best Care – The Best Care program is a 10-hour curriculum designed to provide training to child care providers. The multidisciplinary curriculum provides training in 1) resource management, 2) nutrition, 3) health and safety and 4) child development/child care. The Best Care program is verified training that meets both the licensing requirements and training criteria for the Arkansas Early Childhood Professional Development System. The Best Care training is conducted in 30 county clusters by Family and Consumer Science agents who are verified trainers through the Professional Development System. To accommodate the needs of providers, The Best Care training is offered in the evenings or on Saturdays.

In 2004, child care providers attended classes on Stress Management for Early Childhood Professionals, Attitude Make Over: Enhancing Staff Morale, Nibbles for Health: Sharing Sessions and Nutrition Newsletters for Parents, Nutrition Basics for Children, Healthy Mouths and Happy Smiles, Safe Responses for Childhood Emergencies, The Importance of Smooth Transitions, Character Education for Preschoolers, Involving Parents with Family Fun Night, and Media Wise: Healthy Viewing in Early Childhood. Each of The Best Care trainings is designed with engaging activities and applied resource materials.

Best Care Connected – Best Care Connected is a way to experience quality child care training through the convenience of the Internet. As a web-based training program, Best Care Connected can be taken at locations and times most convenient to early childhood professionals. Although early web-based programs were little more than an online book,

more recent developments have added a number of learning aids that encourage interactivity and connect participants to a community of learners. To make it engaging, Best Care Connected is designed with activities, review questions, and situational discussion questions. The program is supported with after-hour technical support. In 2004 the topics included: 1) Supporting Children with Special Needs, 2) The Fact and Fiction of ADHD, 3) Let's Have Fun with Fitness, 4) Caring for Infants and Toddlers, 5) Ouch! Biting Hurts, and 6) Sharing and Generosity.

Extension Program Results and Accomplishments

Output Indicators

2004 Program	Providers Reached	Hours of Training	Classes
The Best Care	1,989	288	88
Best Care Connected	562	5 - Spring 5 - Fall	2

Outcome Indicators

The Best Care

- 97% of participants *Agree or Strongly Agree* that the trainer was knowledgeable on this topic.
- 97% of participants *Agree or Strongly Agree* that the purpose of the unit was clear.
- 96% of participants *Agree or Strongly Agree* that the information and activities met the purpose of the unit.
- 93% of participants *Agree or Strongly Agree* that the unit was interesting.
- 97% of participants *Agree or Strongly Agree* that the trainer was open, friendly, and encouraging.

Best Care Connected

- 17% of participants *Strongly Agree* that technical assistant was open, friendly and encouraging.
- 66% of participants *Strongly Agree* that the authors of the material were knowledgeable on the topics.

- 71% of participants *Strongly Agree* that the purpose of the lessons was clear.
- 68% of participants *Strongly Agree* that the information and quizzes met the purpose of these lessons.
- 64% of participants *Strongly Agree* that the lessons were interesting.
- 75% of participants *Strongly Agree* that the course content was useful.
- 15% of participants *Strongly Agree* that the course content was challenging.
- 47% of participants *Strongly Agree* that it was easy to find their way through the web site.
- 59% of participants *Strongly Agree* that the course materials were well organized.
- 11% of participants *Strongly Agree* that the quizzes were easy.
- 55% of participants *Strongly Agree* that the quiz instructions were adequate.

Source of Funds

Best Care and Best Care Connected child care training projects are funded through a grant from the Arkansas Department of Human Services, Division of Child Care and Early Childhood Education.

Scope of Impact

Dissemination – An announcement of training is done through statewide mailings, county mailings and contacts, state conferences, public service announcements, Division of Child Care and Early Childhood Education newsletter and the Arkansas Early Childhood Professional Development System web site.

Scope of Program – The Best Care training program is conducted statewide. Child care providers from all 75 counties have attended. Best Care Connected is conducted through the Internet.

<p>KEY THEME: COMMUNITY DEVELOPMENT</p>

Program Response:

Arkansas Procurement Assistance Center (APAC)

Contact: Elinor Sue Coates (“Sue”), Program Director, Arkansas Procurement Assistance Center, University of Arkansas Cooperative Extension Service, 127 West 5th St., Malvern AR 72104, 501/337-5355, scoates@uaex.edu.

Situation

In Federal Fiscal Year 2004, the federal government spent at least \$725,996,405 on contracts in Arkansas, plus two or three times that much was spent by state and local governments in Arkansas for every conceivable commodity and service. We estimate about 20% of that went to small businesses. Over 90% of the 61,000 businesses in Arkansas are defined as “small” by the Small Business Administration, and perhaps half are family-owned. Government contracting is fraught with red tape and peculiar methods, so in order to tap into this huge marketplace, Arkansas businesses need help in the form of counseling and technical assistance, and with such non-monetary support, they are extremely successful.

Stakeholder Input

APAC’s stakeholders include Arkansas businesses, referred to as “clients” and “potential clients”; other business assistance programs, referred to as “resource organizations”; and public agencies, referred to as “customers.” Clients are businesses located in Arkansas who have agreed to participate in APAC’s program, receive its services, report the results, and provide comments and input about the program. Their reports are collected and tabulated monthly, and the assistance they request and receive from APAC is documented daily, providing the most effective stakeholder input we have. Potential clients are Arkansas businesses that are or could be government contractors but have not formalized a relationship with APAC yet. Their input is collected informally through oral surveys at conferences they attend, and through the needs they express when interviewed. Resource organizations include those which APAC staff participate in and whose events the staff attends, such as Chambers of Commerce, supplier development councils, professional development associations, minority business development councils, and even offices of elected officials who refer their constituents to us. Customers include contracting officers at federal, state, or local government agencies. Their input is collected informally through conversations and correspondence.

Overview

APAC’s published mission statement reads as follows: “Our mission is to assist the economy and create jobs in Arkansas while providing quality products and services to government agencies. APAC provides businesses with the marketing know-how and

technical tools to obtain and successfully perform on federal, state and local government contracts and subcontracts.”

A more specific mission statement would be: “To provide training and resources that help Arkansas businesses generate revenues and thereby create or retain jobs for Arkansans through effective government contracting.”

With a staff of six, three procurement professionals and three administrative support personnel, APAC operates statewide out of two offices located in Little Rock and Malvern, with a part-time satellite in Camden. APAC provides individual counseling, training in group workshops, education through seminars and conferences, access to technical data, a weekly newsletter containing informative articles and listings of local events, an electronic bid-matching service that sends federal and state bid opportunity listings specifically filtered to each client’s stated areas of interest, and a variety of other products and services designed to assist Arkansas businesses succeed with sales to public agencies. In July, an online bid listing web site was added on which state and local bid opportunities are posted daily for clients to log in and search at their convenience.

Extension Program Results and Accomplishments

Output Indicators

- 1,405 Total counseling/consultant sessions held with clients.
- 665 Total number of clients counseled/coached.
- 57 Total number of conferences sponsored or participated in.
- 2,869 Total number of attendees at conferences.
- 33,250 Estimated number of newsletters distributed to clients in 50 weeks.
- 10,000 Est. number of local bid opportunity listings collected and published.

Outcome Indicators

- 945 Total number of contracts awarded to clients as reported.*
- \$75,196,107 Total dollar value of contracts awarded to clients.*
- 2,885 Total jobs created or retained as a result of these contracts.*

*We believe that the program impact may exceed what is reported.

Description of Activity, Program, Product

Of 665 active clients in 2004, 392 received individual counseling sessions and the rest received technical assistance not formally classified as counseling. A counseling session is any conversation, correspondence, or meeting with a client in which the client requests assistance with an issue related to government contracting, and APAC staff responds with advice, technical tools, data, or other information to help the client solve the problem. A typical session is when a client has learned of an opportunity to bid on a requirement published by an agency, and doesn't understand the documents required for submitting a bid; our staff will spend an hour or more explaining what the customer expects and how to respond correctly. Another typical session is when a client has learned of an opportunity to bid and cannot get access to drawings or specifications required to estimate the job; our staff will locate the required documents, teach the client how to find them in the future, and perhaps actually order the documents for the client if they are not available as free public documents. There are as many examples of activities as there are hours in the year. Sessions that are not counted in the statistical data include issuing the newsletter with its technical information and advice, providing electronic bid opportunity listings, ordering technical documents without providing concurrent advice or training, and other non-personal assistance, although these sessions are recorded elsewhere. Client data is confidential, but supporting documentation of any program activities can be provided.

A conference is any event at which clients or potential clients, including the general public, attend to receive information about government contracting. The most common topic presented is "How to do business with" the agency that co-sponsors the event. A conference might be a half-day, a full day, or more. Many APAC conferences are presented in the CES auditorium, but APAC participates in just as many conferences presented by other agencies in their facilities or elsewhere around the state. At all such events, UA-CES is identified as APAC's parent organization, and literature about both is distributed. Examples of conferences that APAC sponsored or participated in include:

- A booth at the Conway Business Expo attended by at least 200 people on October 1, 2003.
- Presented two lectures at SBA's annual 8(a) conference attended by 44 small disadvantaged businesses on March 24, 2004.
- Downtown Hot Springs Development Conference attended by 185 on September 30, 2004.
- Minority Enterprise Development awards luncheon on September 15, 2004, attended by 150 at Little Rock Chamber of Commerce.
- Minority Supplier Development Business Opportunity Fair at the Peabody Hotel and Convention Center on June 30, 2004, attended by about 200 people.
- National Association of Women in Construction meeting on April 20, 2004. Spoke on "Managing Changes" to audience of 32.
- "Doing Business with the Air Force" on April 15 at CES auditorium attended by 75 people.

- Sponsored training session on February 4, 2004, for Defense Contract Management Agency to train their employees and contractors in the new electronic commerce technology called “Wide Area Work Flow.”
- Sponsored First Annual Roadshow for Army Corps of Engineers on December 9, 2003, in CES auditorium, which was so successful they booked the second one for the following year.
- Co-sponsored and provided a speaker at the HUD Business Outreach Conference in the CES building on October 30, 2003, which 237 people attended.

During the year, the weekly newsletter, “Arkansas Procurement Briefing,” was streamlined and the three to eight pages of bid listings were omitted, thus permitting distribution as a PDF attachment to group e-mails. It typically includes two to four pages of articles containing technical information and advice about how to do business with public agencies, one page of events occurring in Arkansas related to government contracting, and other announcements to help Arkansas businesses navigate through this difficult marketplace. As a result of launching the new web-based bid-listing bulletin board, designed by Chalmers Davis of the CES Information Technology department, APAC also stopped maintaining files of source data which could be sent to clients who requested more information about any bid opportunity listed, letting them link directly to the customer’s source data online instead.

The local bid opportunity listings which are published in the weekly newsletter are collected by APAC staff daily from electronic sources including newspapers, FW Dodge reports, and agency web sites. We discontinued our subscription to Dodge at the end of the year since their data are now available from other sources at no cost. Some agencies send us their listings and others we collect from their web sites. This very impressive effort is extremely valuable and, although it is all public information, it is not conveniently available anywhere else in Arkansas. It provides access to a vast marketplace that Arkansas companies need in order to succeed with marketing to state, regional, and local public agencies. The previous effort to publish these listings in the weekly newsletter and maintain the source data consumed one full-time position; the new system requires about half of one person’s time and provides more data more conveniently and more accessibly. We limit access through a log-in process that prevents helping out-of-state contractors compete against Arkansans.

Source of Funds

Under a Cost-Sharing Cooperative Agreement between the Defense Logistics Agency and the University of Arkansas Cooperative Extension Service, the APAC total budget for this period was \$620,734, of which DOD provided \$300,000 cash, and the matching funds came from the University’s indirect costs, value equal to five percent of the salary and fringe for the 75 county Extension agents, the value of office space donated by Malvern National Bank and Highland Industrial Park, and other non-cash resources. (The Congressional legislation under which DOD sponsors this program differentiates between

funding for statewide programs which receive a maximum of \$300,000 federal funds, and funding for regional programs which receive a maximum of \$150,000 federal funds, all with at least a 1:1 match requirement. Although these caps were increased by Congress last year, the funding did not come through for Arkansas for the current five-year contracting cycle.) The DOD administers this Agreement under its Grants Administration Regulations, with meticulous program oversight and an audit approximately biennially.

Scope of Impact

Statewide

Dissemination – The program is available to any company that has its headquarters in Arkansas, with particular emphasis on businesses designated as “small” according to SBA’s published size standards. Companies that choose to partake of this service are asked to provide data about the firm’s organization and capabilities, sign a “Request For Assistance” form, and submit Monthly Activity Reports containing results of their government marketing activities. Not all companies are interested in selling to public agencies, and of those that are, not all meet the agencies’ criteria in terms of financial stability, technical capability, and quality performance. APAC helps those that could qualify with assistance and those that already do qualify. Companies that are not ready for this marketplace, such as start-ups, are referred to other resource organizations, such as Arkansas Small Business Development Centers out of UALR, Arkansas Regional Minority Supplier Development Council, or Women’s Business Development Center in Pine Bluff, for assistance until they are ready for our program.

A variety of techniques are used to reach these companies, including occasional newspaper articles, appearances at public meetings and conferences, brochures and other literature left with county offices, Small Business Development Centers, and other resources. A very important outreach tool is the APAC web site at uaex.edu which is now maintained by electronic submittals of updates and new information. A new technique called “group e-mail” to reach clients and former clients in certain counties has been very effective for announcing workshops in their area.

All of APAC’s training workshops are open to the public, and attendance lists are maintained with statistical summaries of socio-economic data on attendees.

Scope of Program – This program is specific to Arkansas. It is one of about 90 such centers nationwide sponsored by the Defense Logistics Agency and locally hosted by organizations such as universities, county or state agencies, and non-profit organizations in those states. Some of the centers are statewide, like ours, and some are regional, serving certain counties within their states. Our program serves all 75 counties in Arkansas and receives the maximum federal dollars allowed. The county Extension agents provide outreach by displaying our literature in their offices and referring clients to our office. We serve most of our clients by phone, fax, and e-mail without ever seeing

them. We travel to outlying areas in the state to hold office hours and present orientation workshops; these trips vary from one day a month to one or two days a year, depending on demand and perceived need. These outreach presentations are often hosted by a Kiwanis Club, a Chamber of Commerce, or a Workforce Development in the local area.

Because we are one of a nationwide network of such centers in 48 of the 50 states, we have access to the experience and knowledge in all the centers, by engaging in e-mail chat and semi-annual national conferences. When one of us has a client request we can't answer, we can ask the entire network for advice. We can also compare notes with other centers on techniques that work or don't work, resources that are useful or not useful, and ideas for improving our services. So, although we provide services only to Arkansas businesses, we draw on nationwide resources to do so.

The socio-economic breakdown of revenues generated into the Arkansas economy through government contracts and subcontracts awarded to APAC clients indicates that typically under-served population groups are receiving a significant share of this activity. Small Disadvantaged Businesses (most of which are owned by minorities) receive about 25% of the total dollars reported, and 242 of our active clients state they meet the criteria for "disadvantaged." Women-owned businesses receive about a 23% of the total dollars reported, and 198 of our active clients are women-owned. Clients located in Historically Under-utilized Business Zones (HUBzones) receive about six percent of the total. We are not sure our socio-economic data are accurate, since it is voluntary and cannot be verified. Forty-two of Arkansas' 75 counties (56%) are designated "distressed," which means low per capita income or high unemployment rate. Of our currently active clients, 186 are located in "distressed" counties and 150 are located in HUBzones. About 11.7% of the contract dollars reported are to companies in "distressed" counties, resulting in about 860 jobs created or retained there. We revised the Monthly Activity Report format which clients are asked to submit to us, and are better at enforcement to make sure they submit it, which we believe has improved the quality of our data over the previous year. Nevertheless, APAC strongly focuses on under-served segments of the population, in geographic terms as well as in socio-economic terms.

Programs of Excellence

Several clients have reported significant achievements. One is a real estate brokerage owned by a minority woman. They bid on a large contract to handle properties listed by the U. S. Department of Housing and Urban Development (HUD), including foreclosures on FHA loans. Our client did not win the contract, which was awarded to a New Hampshire firm. With our guidance, the client contacted the out-of-state firm and offered to serve as a subcontractor to handle the listings in Arkansas. The resulting arrangement proves to be very successful for our client and protects them from the difficulties normally associated with doing business with HUD.

A machine shop had submitted several bids based on manufacturer's part numbers as specified by the military. Due to the customer's mistake, the parts were then identified by National Stock Number instead of manufacturer's number and the documentation could

not be matched up. As a result, the client was considered delinquent in delivery and could not get paid. With our guidance, the client was able to get the customer's error corrected, so that their performance rating was not jeopardized, and they received full payment.

A Hispanic business owner received notice that he would receive a large contract from the National Forest Service if his registrations were completed on time. He said that his offer was accepted because of the help we provided to him in preparing it properly. Although he speaks and understands English well, the language barrier causes some confusion, especially with government terminology. With our help, the customer was contacted and the requirements were clarified, then we helped him complete the registrations in various government databases, and he received the contract.

We have dozens of this kind of report for Federal Fiscal Year 2004.

Program Response: Economic and Community Development and Public Issues Education

Contact: Tony E. Windham, Section Leader - Agricultural Economics and Community Development, 501-671-2000, twindham@uaex.edu

Situation

Improving the economic well-being and quality of life for Arkansans and Arkansas communities is increasingly challenging in today's world. Issues such as globalization, changes in information technologies, government regulatory and fiscal policy, demographic shifts, threats of terrorism, and social needs all impact our society. Education programs are needed to help citizens, businesses, and communities deal with these issues and take advantage of opportunities that accompany these changes.

The needs are numerous. Counseling, education, and technical assistance for home-based and other small businesses are needed for rural economic development. Business owners and professionals need continuing education regarding changes in regulatory and tax policy. Youth and adults need leadership, government, citizenship, and issue-driven knowledge and skills so that they can act strategically to position their communities for continued economic viability and success.

Stakeholder Input

Input is actively sought from a variety of sources including state and community leaders, partnering organizations, professional associations, government agencies, advisory councils, county faculty, and program participants. Input is received through a variety of

methods including focus groups, program evaluations, surveys, and individual communication via telephone, the internet, mail, email and face-to-face conversations.

Overview

Public Issues Education

Voters, farmers, business and government at all levels are increasingly called upon to make decisions about issues such as resource allocation and use, water quality, taxation, public finance, and public health. The issues are complex, cutting across a range of academic disciplines, stakeholder groups, and value systems. These factors, coupled with a lack of understanding by citizens and stakeholders concerning other perspectives, often result in a contentious atmosphere for decision making.

Public issues education is not new to the Division of Agriculture. Since the 1970s, the Cooperative Extension Service has provided educational programs on current issues ranging from local sales taxes to environmental issues to ballot initiatives. These efforts have been implemented on an ad hoc basis since the mid 1980s. While we have had a long, successful history of providing such information, demand is increasing and expectations of leaders and citizens are growing. A new center was created in FY 2004 to formalize the process of identifying critical issues in Arkansas for which there is a need for additional research and education and develop programs to meet these needs.

Public issues education utilizes a multi-faceted approach. Program delivery varies depending on the issue. For ballot issues, the most critical issue addressed in FY 2004, state specialists develop a variety of education tools and provide training and support for county agents who implement education programs for residents of their respective counties. Education resources and delivery methods include fact sheets, mailings, PowerPoint presentations, information posted on a web site, flyers, displays, press releases and televised tapings, and web broadcasts of discussions on the issues.

Citizen Action Produces Strength

The Citizen Action Produces Strength (CAPS) workshop is a three-day citizenship workshop for 4-H youth ages 12 to 14. Delegates survey leaders and youth in their community, campaign for office, elect officials for CAPS city, prepare a plan to improve their neighborhood, take a trip to see local government in action, and develop a plan to address an issue in their home county. CAPS also includes a two-day training session for eight CAPS counselors who run the workshop. The program is available to 12- to 14-year-old Arkansas youth who are 4-H members. The information regarding CAPS is updated annually in the 4-H Activities Manual, which is provided to and is available in every county Extension office. Reminder letters are also sent to county agents prior to the event. The event is publicized in Extension's blue letter and is available on Extension's web site.

Home Based Business

The Cooperative Extension Service Home-Based Business Program was developed to assist Arkansans who desire to establish and/or maintain a home-based business. The Home-Based Business Program functions through three avenues: workbooks, consultations, and seminars. The program is available to all Arkansans interested in starting a home-based business or needing assistance with a current home-based business. All counties have a copy of the Home-Based Business Workbook produced and printed by the Cooperative Extension Service. The manual is also available on a loan basis to CES county clients.

National Institute on Cooperative Education

The National Institute on Cooperative Education (N.I.C.E) is the largest annual national conference dedicated to the topic of agricultural cooperatives available. The program is hosted by a different state each year. The youth who attend N.I.C.E are sponsored by the Arkansas Committee on Rural and Agricultural Cooperatives and are, therefore, essentially paid for through funds received by the committee from Arkansas cooperatives.

Arkansas Farm Income Tax Schools

The University of Arkansas Farm Income Tax Schools update and inform practitioners, bookkeepers and Certified Public Accountants on changes in federal, state, and Social Security tax regulations. Participants received 16 hours of Continuing Professional Education credits. The school is available to anyone who prepares taxes for the public or who prepares their own taxes. Brochures are distributed in late August through dispatch to all county Extension offices and to past participants, as well as interested individuals included on a master mailing list. Tax School information is also available on the Web.

VisionWorks

With a goal of helping communities create their future, the VisionWorks Breakthrough Solutions Program taps the expertise of the Cooperative Extension Service and partner organizations in conducting a series of seminars, incorporating an understanding of the Knowledge-Based Economy as a key component in the broad-based holistic community development effort.

This new Breakthrough Solutions Program is based on ten principles for strategic leadership and innovation. The ten principles include involving the citizens in creating their future, understanding major forces and trends, leveraging strategic assets, using a systems approach, tapping innovation, collaboration, IT and broadband, strategic marketing, alternate futures, and sustaining the development process. Although strategic plans become out-of-date when the environment changes, the need for community leaders

who can think and act strategically never changes. As the communities develop and implement their plans, technical assistance is given to them to help them effectively engage their communities and identify resources critical to their efforts.

Economic Development Program Summary

A wide range of local economic development issues were addressed by county and state faculty during the year. The Cooperative Extension Service provided information and analysis on issues ranging from the provision of community facilities and services to the revenue and economic impacts that would be generated from increasing tax rates and new businesses. This information and analyses was provided at the request of local government officials and community leaders.

The Cooperative Extension Service also provided an analysis of the changing nature, economic status and structure of families in Arkansas, an analysis of the major demographic, social and economic issues facing rural Arkansas, and an updated study of the economic impact of agriculture on the Arkansas economy. These analyses were provided to local and state elected officials and to community leaders to enhance their understanding of the major issues facing rural communities. It is envisioned that a better understanding of the issues facing rural Arkansas will lead to more effective programs and legislation to address these issues.

Extension Program Results and Accomplishments

Output Indicators

- 5,378 Number of total contacts reported related to economic and community sustainability and growth.
- 59 Number of events reported related to economic and community sustainability and growth.
- 2,098 Number of individual contacts reported related to public issues education.
- 2 Number of events reported related to public issues education.

Outcome Indicators

- 125 Number of educational publications, newsletters, and other materials produced.
- 125 Number of educational publications, newsletters, and other materials distributed.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – The educational program and resource materials are available to all counties and statewide organizations that want to better understand the needs of their constituencies. Resource materials are available in printed copy and on the Cooperative Extension Service web site.

Scope of Program – These programs have been delivered at some level in all 75 Arkansas counties.

Programs of Excellence

Polk County Makes Great Strides, With Over \$9 Million Impact and 73 New Jobs

Located on the Arkansas-Oklahoma border, Polk County may be isolated from major population centers in the state, but it has the energy of a large city. A Polk County VISION 2010 Steering Committee of committed community leaders was formed when the county participated in the VISION 2010 Program, and that committee continues to make things happen. At a recent Polk County Vision 2010 Committee meeting, the following reports were given:

- Quality of Life Committee – the Wellness Subcommittee reported that a Walk Across Polk County attracted over 200 participants, and the Health Fair attracted 190 citizens.
- Several area fire departments received a grant to upgrade their equipment and make safety vests. The Polk County Extension Homemakers made over 250 vests for the firefighters.
- Ouachita retirees and seniors received a grant to build an assisted living center in Mena.
- Southwest Artists have expanded their gallery and are painting a mural for children at the Health Department.
- Workforce Education Committee – set up a training facility at the airport and are building skills in local organizations.
- Downtown Revitalization Committee – are working on a streetscape, with four blocks already completed. They have also ordered new banners, paid for by local organizations.

- Industrial Development Committee – have expanded the airport hangars, erected a security fence around the airport, and are setting up a weather signal that is linked to the weather channel and the National Weather Service.
- Economic Development Committee – is seeking to expand existing industries, recruit new industries, and bring I-49 through the community. In addition, the hospital is expanding and moving toward becoming a regional medical center.
- Youth Community Development Committee – the city has purchased 74 acres and will purchase six more. They will soon begin constructing on a youth recreation complex for basketball, softball, baseball, soccer, a splash pool, walking trails, a skateboard park, and an amphitheater.

The investment from internal and external sources for downtown revitalization, industrial improvement, economic development, recreation development, and workforce education totals \$9,656,371, with 73 new jobs created.

<p>KEY THEME: FAMILY RESOURCE MANAGEMENT</p>

Program Response:
Financial Security in Later Life

Contact: Lynn R. Russell, State Leader – Family and Consumer Sciences, (501) 671-2109; lrussell@uaex.edu

Situation

Arkansas families face significant economic challenges to include:

- Not enough savings to meet emergencies or a sudden loss of income.
- High credit use and misuse that increases credit costs, automobile or life insurance premiums and hampers their search for employment.
- Bankruptcy filing in Arkansas rose 32% between 2000 and 2003. This includes a 12% increase between 2002 and 2003 and a three percent increase from 2003 to 2004.

- Low median annual incomes to purchase needs and wants.
- The combination of a low national savings rate and high debt levels means few families have sufficient dollars to save for retirement or plan for the long term, including making estate plans.

Stakeholder Input

Program planning teams composed of Family and Consumer Sciences agents from all districts and state specialists met twice and identified priority issues in family resource management. Agents and specialists constantly networked with local and state groups including Arkansas Advocates for Children and Families, Kids Count, Family Self-Sufficiency Working Group, AARP, Consumer Credit Counseling, Arkansas Department of Human Services, and Area Agencies on Aging to identify current needs. The Focus Groups and Initiative Teams used this input to frame the priority issues. Using a discussion and priority setting process, the County Extension Councils in Arkansas counties identified resource management as a major emphasis for their long-range education program.

Overview

The Financial Security in Later Life National Initiative was adopted as a focus program. The objective of the program is to prepare individuals and families for retirement years. Subjects addressed include modifying family spending and consumer credit use in order to dedicate funds for retirement savings, calculating the total amount of money needed for retirement, addressing long-term care needs, and estate planning.

Extension Program Results and Accomplishments

Output Indicators

- 74 Number of educational events related to Financial Security in Later Life.
- 6,349 Number of participants attending educational meetings related to Financial Security in Later Life.
- 1,450 Number of persons receiving education information via mail/e-mail/mass mail, newsletters, on-site, or by telephone.
- 104 Number of volunteers who spent 656 hours teaching 2,246 others.
- 14 Number of collaborations related to Financial Security in Later Life.

14 Number of media efforts related to Financial Security in Later Life.

Outcome Indicators

150 Number of participants who initiated or increased contributions to a savings plan.

75 Number of participants who reduced or eliminated consumer credit debt.

3 Number of participants who reviewed or prepared a beneficiary designation.

2 Number of participants who reviewed or prepared a trust.

8 Number of participants who reviewed or prepared a will.

11 Number of participants who use calculated cost estimates to establish savings/retirement goals.

\$4,999 Total consumer credit debt reduction reported by participants.

\$4,999 Total dollars reported saved by participants.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – Goals, objectives, situation statements, background statistics, marketing tools, curricula, and other annotated resources are available on a Family and Consumer Sciences Department intranet web site and a national web site. Existing resource materials were supplemented with additional resources on the state web site. A monthly e-mail money management hint provided additional updates for agents and clientele. Agents were encouraged to order materials to fit their county programs. The program included direct teaching in workshops or single presentations, leader training, and use of mass media and newsletters.

Scope of the Program – 1) State Specific. Participating Counties: Clay, Crittenden, Mississippi, Izard, Johnson, Howard, Independence, Jefferson, Lonoke, Lee, Prairie, Randolph, Van Buren, and Yell.

Program Response:

Planning for the Long Term

Contact: Lynn R. Russell, State Leader – Family and Consumer Sciences, (501) 671-2109, lrussell@uaex.edu

Situation

Significant issues faced by Arkansas families in preparation for the aging years include:

- The combination of a low national savings rate and high debt levels means few families have sufficient dollars to save for retirement or plan for the long term, including making estate plans.
- Learning to adapt lifestyles as each person experiences physical changes.
- Learning to cope with loneliness, anxiety, and depression.
- Practicing care-giving skills to help the frail and sick adapt to their shrinking world.

Stakeholder Input

The Planning for the Long Term Focus Program uses a three-prong approach – financial, health, and social – to educate Arkansans on planning for a quality of life in later years. The Planning for the Long Term Focus Program committee composed of Family and Consumer Sciences agents from all districts and the resource management and health and aging specialists met three times to identify program goals and resources that would address program goals. Agents and specialists networked with local and state groups including AARP, area agencies on aging, county senior citizens centers, and local Extension Homemakers Clubs, to determine program needs.

Overview

The Planning for the Long Term Focus Program was developed as a multi-prong thrust to address retirement and aging issues from three perspectives – financial, health, and social. The objective of the program is to prepare individuals and families for retirement years. Topics addressed included learning to adapt to a changing financial situation, assessing long-term care needs, adjusting to one's own or another's physical and mental health changes due to aging, and improving care-giving skills. Curriculum materials were identified and developed for each topic. Agents were trained in small groups in the use of the curriculum materials during December and January. The Arkansas Extension Homemakers Council adopted a proposal to make care-giving an emphasis program for the next biennial program year.

Extension Program Results and Accomplishments

Output Indicators

- 68 Number of educational meetings held related to Planning for the Long Term.
- 3,336 Number of participants attending education meetings related to Planning for the Long Term.
- 2,779 Number of persons receiving education information via mail/e-mail/mass mail, newsletters, on-site, or by telephone.
- 1,231 Number of hours spent planning, conducting, marketing, and evaluating educational programs related to Planning for the Long Term.
- 18 Number of volunteers who spent 35 hours teaching 153 others.
- 17 Number of collaborations related to Planning for the Long Term.

Outcome Indicators

- 54 Number of participants who adopted one or more measures to enhance their capacity to care for another person during the later stages of life.
- 42 Number of participants who changed one or more daily behaviors to accommodate decline in sight, hearing, taste, smell, or physical changes that affect activities of daily living.
- 42 Number of participants who changed the way to relate to those experiencing declining sight, hearing, taste, smell, or physical changes that affect activities of daily living.
- 89 Number of participants who improved knowledge of appropriate housing and transportation choices for later years.

Source of Funds

Smith-Lever.

Scope of Impact

Dissemination – Goals, objectives, situation statements, background statistics, marketing tools, curricula, and other annotated resources are available on a Family and Consumer Sciences department Intranet web site. Agents were encouraged to order materials to fit their county programs. Programs were delivered to EHC, Area Agency on Aging, AARP,

and general Extension audiences. Media releases were prepared with topics of interest to elders and their caregivers.

Scope of the Program – State Specific. Participating counties: Lawrence, Poinsett, Prairie, Sharp, and Dallas.

KEY THEME: FARM SAFETY

Program Response: Farm Safety Programs and Farm Accident Rescue Workshops

Contact: Gary Huitink, Biological and Agricultural Engineering, 501-671-2242, ghuitink@uaex.edu

Situation

Agriculture is one of the most dangerous work environments in Arkansas today. According to National Safety Council records, they consider agriculture the second most dangerous occupation after mining. They estimated the average national cost in 2000 was \$940,000 for a work-related death and was \$28,000 for a work-related injury. Arkansas costs vary, but the cost of medical care, especially, has risen since 2000. Injuries and accidents often become more traumatic when individuals work alone, sometimes in areas distant from any medical facility.

Stakeholder Input

Farm safety concerns reach us from program planning activities. Accidents are traumatic for the victim and the victim's family. Costs to the victim have become high, and employers are interested in mitigating lost time, employee impairment, insurance premiums, and potential litigation.

Overview

A variety of activities targeted farm injury and fatality reduction in Arkansas this year. Educational programs and publications have been provided. Some counties emphasized farm youth safety, including several Progressive Farmer Kids' Day Camps. Four states pooled their manpower and educational materials and jointly staffed a booth at the Mid-South Farm and Gin Show to increase awareness of safer management techniques and to provide consultation to producers and ginners. Ginners and gin workers attended one of three regional programs addressing gin press hazards and management perspectives to gain understanding of hazards and plan safer approaches. Several counties have focused on various youth hazards including ATVs, farm animals, tractor overturns, PTO entanglements, etc.

A meeting focusing on dairymen to emphasize management, farm hazard reduction and potential farm liability in conjunction with the ARK-TENN Field Day at Center Ridge was well-received.

Another emphasis was to train EMTs and volunteer fire department personnel regarding efficient accident rescue techniques at two-day Farm Accident Rescue workshops. Improved team skills, communication and decision making and securing better equipment for rescuers were outcomes. Programs provided “hands-on” experience to emphasize techniques to help reduce trauma and death when a farm accident occurs. This is a joint program between Arkansas Farm Bureau and the Cooperative Extension Service.

Extension Program Results and Accomplishments

Output indicators

- 500+ Farm owners, managers, workers, consultants, and safety personnel that participated in meetings specifically on farm and gin safety topics.
- 200+ Gin owners, managers, and workers participated in joint training conducted by Cooperative Extension Service and the Southern Cotton Ginners’ Association.
- 45+ Rescue personnel were introduced to proper air evacuation techniques and practiced rescues using air bags (standard rescue tool for entrapment), all of whom had little prior experience.
- *Identify Hazards and Prevent Accidents* and *Common Agricultural Accidents* were included on the CES web site for emphasizing managing farms safely.

Outcome Indicators-Program Impact

- The number of reported Arkansas farm fatalities declined from 19 in 1999 to 10 in 2003, indicating a good trend. Workshop participant comments, greater use of safety resources and requests for assistance, etc., indicate a growing awareness of how vital it is to use safe agricultural work practices.
- Other states have patterned their rescue training efforts after the model developed in Arkansas.

Source of Funds

Smith-Lever and a \$13,400 Federal Farm Safety Cooperative Extension Service grant.

Scope of Impact

Dissemination – Programs are available through county Extension offices with joint support of Arkansas Farm Bureau and the University of Arkansas Cooperative Extension Service. Workshops are listed on our Cooperative Extension Service web site when the

event is scheduled. A management guide, “Identify Hazards and Prevent Accidents,” which emphasizes safe workplaces is available on the UA CES web site. Both Alabama and Nebraska Extension Services reference our *Tornado Safety* fact sheet, and many other states have adopted portions of this fact sheet since it was placed on our web site.

Scope of Program – All farms can benefit from aspects of safety management and hazard reduction. However, collisions on public roadways are a growing concern. More emphasis on tractor overturns is warranted in the livestock-producing areas of Arkansas.

KEY THEME: LEADERSHIP TRAINING AND DEVELOPMENT

Program Response: The LeadAR Program

Contact: Dr. Joseph D. Waldrum – Director of Organizational, Staff and Leadership Development, P.O. Box 391, Little Rock AR 72203, 501-671-2076-Phone, 501-671-2056-FAX, jwaldrum@uaex.edu

Situation

Developing leaders in rural Arkansas communities with a global vision is critical to maintaining growth and quality of life in these areas and statewide. There has been a decline in the number of rural and urban residents (both youth and adult) willing to take a leadership role in many Arkansas communities. The need to train and educate those who want to “make a difference” has increased. The interface between urban and rural or agricultural citizens has created conflicts that can be resolved through education and training to identify and locate the resources and sharpen the skills of those willing to be change agents.

Stakeholder Input

County Extension agents, County Extension Councils, the LeadAR Advisory Council, county Farm Bureau boards, local utility managers, elected officials, and alumni of leadership programs submit names of good candidates for LeadAR and other leadership programs. They also promote ideas of issues that need to be discussed at seminars or study tours. Every two years we advertise the program to the above groups and encourage input for positive program changes. Input is considered by the program director and the LeadAR Advisory Council and appropriate changes in curriculum are made. The

Advisory Council meets twice a year to review the program and make recommendations to modify the selection process, fund raising, and the issues addressed in the program. Active efforts are made to contact minority alumni of the program to recruit other minority candidates for the program. This past year efforts were made to recruit Hispanic candidates through the Hispanic representative in the Governor's office. Even though this was not successful, further contacts were identified that will encourage Hispanic applicants for the next class.

Overview

LeadAR is a two-year adult leadership development program that recruits participants from primarily rural and agricultural communities. It consists of 12 three-day seminars that discuss various issues important to the State of Arkansas, i.e., education, agriculture, forestry, environment, economic development, criminal justice, and others. A few seminars focus on training in leadership and interpersonal skills. Additional components of the program include a 10-day national study tour to Washington, D.C., and a two-week international study tour outside the United States. The purpose of these tours is to learn how to access the resources of the federal government and to learn about another culture in another country. Participants are given homework before each seminar to learn about their local resources and also set a community leadership project goal to be completed by the end of the program. Applicants must be 25 years old and have had some experience in a leadership role. They are selected through a competitive process that includes an extensive application and interview process. Selection committees include external stakeholders, LeadAR alumni, and county and district Extension personnel. Committees are charged to purposely select a diverse class from various geographic areas, occupations, ages, gender, and races. The primary impact of the program is in improved leadership skills, self-confidence, knowledge of major issues affecting Arkansas, and people networks formed within the class and at the local, state, national and international levels. Completions of community projects or goals are readily measurable impacts of LeadAR.

Extension Program Results & Accomplishments:

Output Indicators

- 6 Three-day training seminars conducted for LeadAR participants.
- 1 National Study Tour to Wisconsin and Washington, D.C.
- 35 Individuals participated in LeadAR Class 11.

Outcome Indicators

- 35 Individuals trained in LeadAR reporting adoption of new skills or using

knowledge gained

- 6 Individuals from Class 11 that began new leadership positions. Examples:
 - Glen Beedle appointed as City Treasurer for Arkadelphia.
 - Sylvester Smith to the Director of Minority and Small Business programs of the Arkansas Department of Economic Development.
 - Kris Steelman to Business development Manager of Baxter Healthcare in Mountain Home.
 - Stan Vlademar appointed to the Fort Smith Salvation Army Board.

- 12 New community projects completed by Class 11. Examples:
 - Karen Ballard received a \$1,000 grant to support the Roland Crisis Closet.
 - Glen Beedle conducted a feasibility study for cooperative services between the cities of Arkadelphia and Caddo Valley.
 - Doug Brandon formed a Perry County Chamber of Commerce.
 - Jim Pat Flowers developed a curriculum to teach Marianna high school students about basic legal issues.
 - Bill Gregory created a literacy and reading program in the Alma elementary schools.
 - Stan Vlademar developed and implemented a landscape plan for the welcome sign area to the city of Van Buren.
 - Monty Williams coordinated placing welcome signs for the city of Bryant on Interstate 30.
 - Sabre Yocham established a Boone County Health Coalition.

Source of Funds

LeadAR is funded from Smith-Lever funds, corporate and alumni contributions, and each participant pays tuition of \$1500 for the two-year program. An endowment to partially support the program was begun in 1995 by the LeadAR alumni and now has approximately \$165,000 in the corpus.

Scope of Impact

Statewide Dissemination – LeadAR is available to any Arkansas citizen over 25 years old with some leadership experience. Information about the program is available in all 75 county Extension offices via brochures, at the state headquarters, on the University of Arkansas Cooperative Extension Service web site, through alumni and print, radio, and television media.

Scope of Program – The program is exclusively for Arkansas citizens. Sixty-nine of the seventy-five counties in the state have had from one participant to as many as 26 in the program since its inception in 1984. Part of the national study tour is to meet participants from another state program like LeadAR. Home stays are arranged to learn about another

program and issues in another state. Class 11 went to Wisconsin and spent two days in homes in locations all over that state.

KEY THEME:

PARENTING

Program Response:

Guiding Children Successfully

Contact: H. Wallace Goddard, Family Life Specialist, Family and Consumer Science Section, 501-671-2104, wgoddard@uaex.edu

Situation

American children face unprecedented challenges. The frustrations and demands of a fragile economy, heavy work schedules, stress overload, family dissolution, and personal uncertainties put a heavy load on young Americans. The problems are further aggravated by the lack of training available for adults in dealing with child rearing and child care issues. The need for solid, practical, research-based information for parents and other caregivers is increasing at the same time that American adults are less likely to be reached by traditional informal educational processes such as meetings and neighborhood gatherings. Unfortunately, much of the popular wisdom about family process is mistaken, even counterproductive. American families face a stress and disinformation crisis. Cooperative Extension, with its extensive network and research-oriented personnel, is uniquely qualified to respond to the challenge.

Stakeholder Input

Brazelton and Sparrow (2001) have observed that parents and caregivers are desperate for information yet are unsure where to get information that is reliable. While good childrearing may be the most important work that any society can do to assure its future, it is estimated that 90% of parents undertake the task without any specific training. A meeting of FCS agents and a meeting of the Marriage, Parenting, and Family Life Initiative Team determined that the highest priority in Arkansas communities was for quality, research-based information on family life that could be used in multiple ways. Some of that need was addressed by providing a richness of information units on the Arkansas Families web site (www.arfamilies.org) that can be used in various media: newspaper, radio, newsletters, and trainings. These resources, called Family Life: Challenges and Choices, are widely used both by Extension personnel and by clients. There were over 5,000 non-Extension hits to the web resources during 2003. There were

an unspecified number of client contacts with this information through newsletters, media, and county programs.

Yet all of these contacts reach only a small percentage of Arkansans. There is a continuing need both for good information and for an increased awareness that such solid, research-based information is readily available.

Overview

Working closely with the production staff at Arkansas Educational Telecommunications Network (AETN), the Communication and FCS faculty of the University of Arkansas Cooperative Extension Service developed the concept and program outlines for a new public television series entitled “Guiding Children Successfully” (GCS). Each show is an hour-long program that includes practical tips for parents and caregivers. The developer and host for each show is H. Wallace Goddard, Extension family life specialist. Dr. Goddard’s training in family life, together with training in instructional psychology, make him uniquely qualified to develop this television series.

Dr. Goddard draws on Extension personnel to provide technical support (taping, publicity, design) and content specialists for the shows. In fact, the extraordinary capacity of the communication department with excellent videographers, graphics specialists, and communications specialists has been an essential element of the show’s success. With the support of the remarkable Extension network, the program organizers have also been able to identify and involve excellent panelists for the shows.

The 12 shows in “Guiding Children Successfully” focus on providing parents and other caregivers with practical, sensible information to help children develop into healthy, contributing adults.

UACES wrote a proposal to the Arkansas Division of Child Care and Early Childhood Education to make the 12 shows available through county Extension offices to child care providers statewide. When the project was funded, the GCS leadership team developed learning checks and support materials to accompany the shows.

Through the county offices, the shows are available not only to providers, parents, and community groups, but also for the courts and agencies to use with caregivers who are identified as needing special training.

Since training of child care providers began in January 2004, 2,822 hours of training have been successfully completed by 553 participants.

Extension Program Results and Accomplishments

Output Indicators

Twelve one-hour shows designed, taped, and edited. Each show has aired on AETN many times, which translates into dozens of television hours of training for a wide audience in Arkansas. The National Educational Telecommunications Association (NETA) has adopted “Guiding Children Successfully,” thereby making the series available to audiences nationwide. According to NETA records, “Guiding Children Successfully” has aired on 60 stations across the nation, reaching 31.22% of the public television audience in the United States. Four of the 10 major markets (New York, Los Angeles, Philadelphia, and Atlanta) have aired GCS. As of August 2004, 14 stations were airing the series.

Outcome Indicators

Program Impact – “Guiding Children Successfully” has enjoyed a very positive reaction in Arkansas and states nationwide. While it is not possible to track all broadcast viewers of the show, hundreds of thousands of people nationwide have viewed shows from the series.

Among child care providers who have viewed shows, 90% have successfully completed the learning checks, suggesting that the shows effectively teach the material for most viewers. Since training of child care providers began in January 2004, 2,822 hours of training have been successfully completed by 553 participants.

Source of Funds

Smith-Lever 3b and 3c for all Extension planning, filming, and producing, AETN for production and broadcast costs, and the Arkansas Division of Child Care and Early Childhood Education (Professional Services Contract Number 4600003835) for providing GCS tapes to county Extension offices for providers and parents.

Scope of Impact

Dissemination – Not only are shows from “Guiding Children Successfully” available through public television broadcast in Arkansas and many states nationwide, but also videotapes and DVDs of all shows are available to all parents and professionals through all 75 county Extension offices in the state of Arkansas.

Scope of Program – 1) Arkansas: Tapes of “Guiding Children Successfully” with all support materials are available through all 75 counties in the state of Arkansas. All FCS agents have been trained in using the programs and managing the support materials (including learning checks).

Between January and the end of September 2004, 553 child care providers completed 2,822 hours of training using “Guiding Children Successfully.” This has exceeded all expectations manifold. The shows have been a popular and convenient way for many providers to get verified training hours. With the system of learning checks, we can verify that the participants not only viewed but mastered the essential content of the shows.

2) Multistate: The National Educational Telecommunications Association (NETA) has adopted Guiding Children Successfully, thereby making the series available to audiences nationwide. Guiding Children Successfully has aired on 60 stations across the nation reaching 31.22% of the public television audience in the United States. Four of the 10 major markets (New York, Los Angeles, Philadelphia and Atlanta) have aired GCS. As of August 2004, 14 stations were airing the series.

<p>KEY THEME: WORKFORCE PREPARATION – YOUTH AND ADULT</p>

Program Response:
Kansas City 4-H Global Conference

Mike Klumpp, 4-H Youth Development, (501) 671-2105, mklumpp@uaex.edu

Situation

Arkansas youth require knowledge of the global, culturally diverse, and high-tech workplace in order to compete and succeed in the job markets of the future.

Stakeholder Input

Agents and leaders who have chaperoned this event have reported it to be one of the best learning experiences for youth with which they have been affiliated.

Overview

The Kansas City 4-H Global Conference is a four-day experience designed to provide insight into a global and high-tech workplace through direct interaction with international companies and to increase appreciation and awareness of the strengths of cultural diversity in a global society. Because of their interaction with business leaders, educators, and international contacts, delegates returned home with increased confidence in their ability to interact in a global society. 4-H members were able to develop an awareness of and appreciation for the strengths of cultural diversity in a corporate climate through academic, personal management, and teamwork skills. In addition to exploring career opportunities, the delegates took part in service learning projects.

Extension Program Results and Accomplishments

Output Indicators

- 45 Arkansas 4-H members who attended the four-day Kansas City Global Conference in Kansas City, Missouri.
- 207 Arkansas 4-H members who have experienced cultural education, including heritage, diversity, and exchanges, as reported on ES-237.

Outcome Indicators

- 8 Arkansas 4-H members who were past delegates reported information gained to the extent that they made application to attend for a second year. One of these members was selected to serve as a facilitator for the Global Conference.

Source of Funds

Participant fees managed by the Arkansas 4-H Foundation fund the program.

Scope of Impact

Dissemination – Program is available to all counties statewide. Information is available on the UAEX web site and through internal communications.

Scope of Program – Participants in this program represented 12 counties from across the state: Benton, Columbia, Faulkner, Fulton, Hot Spring, Independence, Jefferson, Lonoke, Lawrence, Polk, Pope, and Washington.

Program Response: Entrepreneurship Camp

Contact: Joshua Wright, 4-H Youth Development, 501-821-6884, jwright@uaex.edu

Situation

According to the Arkansas Department of Education, 59% of general population fourth-grade students in public schools perform below the current grade proficiency level. In the combined population (including students who receive special education services, those students whose first language is not English, and those students who recently moved into the district), 63% are below the grade-specific level of proficiency on standardized math tests. Help is clearly needed to motivate Arkansas students to develop critical math skills. In addition, many Arkansas youth do not have the opportunity to become knowledgeable about career opportunities and entrepreneurship. The Entrepreneur Camp curriculum combines several educational skills, including math, in an experiential manner; likewise, it introduces the concepts of entrepreneurship and economics to the students.

Stakeholder Input

Evaluations from the previous year's Entrepreneur Camp were carefully studied and key program adjustments were made to enhance educational and social opportunities for the young people. Parents' comments were solicited following camp.

Overview

The Entrepreneurship program is an experience-based approach to teaching children ages 8 to 12 entrepreneurship concepts and preparation for the "real world." Specific program objectives are to:

- Provide children with opportunities to experience entrepreneurship.
- Teach entrepreneurship concepts in the context of these experiences.
- Integrate the study of entrepreneurship with other subjects such as language arts, mathematics, science, social studies, critical thinking, problem solving, arts and cooperative learning.

The Entrepreneurship program was implemented in two ways, the first being a four-day statewide camp targeting underserved youth and the second being implementation at the county level via schools, day camps and with special audiences.

Extension Program Results and Accomplishments

Output Indicators

State Youth Camp – three days and two nights

50 Youth, ages 9-12, who participated in the state camp.

1,000 Hours of educational instruction during the Entrepreneurship Camp.

8 Counselors trained to implement the Entrepreneurship program.

Outcome Indicators

- Students developed an understanding of having to work or produce a product to have an income.
- Participants developed an appreciation of the difference between a “need” and a “want.”
- Students learned interpersonal skills.
- Participants learned to budget money and to keep up with the income they generated.
- Students reported learning how to count money and how to complete a job application.
- Youth learned about partnerships and working together in groups.

Source of Funds

Support primarily by camper fees.

Scope of Impact

Dissemination – The Entrepreneurship program is available to agents/teachers or other persons who have participated in a certified training program. Once trained, the instructors are free to use the educational program as often as they would like. Training has been provided for the past three years at the state level.

Scope of Program – Eight counties statewide have delivered this program including the counties of Drew, Washington, Faulkner, Marion, Little River, Pope, Crittenden, and Jefferson.

KEY THEME: YOUTH DEVELOPMENT/4-H

Program Response: Arkansas AG Adventures

Contact: Willa Williams, 4-H Youth Development, (501) 671-2225,
wwilliams@uaex.edu

Situation

Agricultural Awareness

- U.S. consumers spend less of their income on food than almost any other nation in the world.
- Farmers and ranchers provide food and habitat for 75% of the nation's wildlife.
- New technologies in agriculture could help solve the problems of hunger and disease as well as increase the number of jobs and lower the cost of living.
- Less than three percent of the population is directly involved in agricultural production, yet about 25% of the state's economy is agriculturally based.
- Tomorrow's citizens, consumers, business leaders, legislators and educators must be agriculturally literate in order to protect and preserve the advantages we gain from a strong agricultural industry.

Stakeholder Input

Producer Focus Groups and results from the Arkansas Farm Crisis Survey both identified a significant need, particularly with children and young people, for an increase in factual public information and education regarding production agriculture.

Overview

Arkansas is a diverse state that depends on a strong agricultural industry. Agriculture is Arkansas' largest industry, providing over \$5 billion a year in farm income. Roughly

one-half of the state's land is devoted to agriculture, and our climate and topography make it well suited for the production of a broad spectrum of commodities. Nationally, Arkansas ranks first in the production of rice and second in the production of broilers. Arkansas is also highly ranked in the production of catfish, turkey, cotton, and soybeans.

Although Arkansas depends on agriculture, it is seldom taught in elementary or secondary schools. Along with the fact that most children are two to three generations away from the farm, there is an increasing need for agricultural awareness.

A center to teach youth about agriculture was established on the University of Arkansas at Pine Bluff Research Farm in Lonoke, Arkansas. Children learn a variety of subjects through hands-on lessons at the center whether they come from rural or urban schools. The program also provides in-school visits to schools that may not be able to send children to the center due to cost or travel restraints.

Extension Program Results and Accomplishments

Output Indicators

- 29 Number of programs held at the agricultural awareness center.
- 12 Number of outreach programs held through the state.
- 100 Number of participants in agricultural awareness workshops at Forestry and Wildlife Camp.
- 1,500 Number of participants in Pizza Ranch.

Outcome Indicators

More than doubled the amount of programs presented at the UAPB agricultural awareness center.

Source of Funds

50% University of Arkansas at Pine Bluff (UAPB) and 50% University of Arkansas Cooperative Extension Service (CES) Smith-Lever funds.

Scope of Impact

Dissemination – The program is available to all youth and adults in the state of Arkansas. The program is available to counties by attending field trips at the center or reserving a program in their county. Materials about the program are available on the web and through the program coordinator.

Scope of Program – Counties that have participated in the field trips include Pulaski, Lonoke, White, Saline, Monroe, Van Buren, and Jefferson.

Program Response: Arkansas 4-H Tech Team

Contact: Willa Williams, 4-H Youth Development, (501) 671-2225,
wwilliams@uaex.edu

Situation

All school-age children and youth will have access to information technology through their 4-H program, opportunities to become skilled in the safe and effective use of information technology and its applications, and the ability to apply their technical skill and knowledge as a tool to enhance their education, career opportunities, contributions to community, and personal life.

Stakeholder Input

The Access the Future Coalition was formed at the 2000 National 4-H Conference by the Access the Future Consulting Group to coordinate the efforts of 4-H youth and adults working in partnership with organizations across the United States to slam shut the Digital Divide that separates our country's technology haves and have-nots. By Digital Divide, we mean the disparities in both accessing and using information technology. Youth from throughout the nation gathered at Conference to identify issues of concern to youth and responses to those issues.

The Access the Future Coalition is the 4-H youth response, our action to help American society address these issues. National leadership for 4-H and information technology comes from the Cooperative State Research, Education, and Extension Service (CSREES), which is part of the United States Department of Agriculture (USDA). Both USDA and CSREES have declared that addressing the issues of the Digital Divide is a priority for the coming year.

Overview

Members of the Arkansas 4-H Technology Team meet to discuss future plans for the team including community service projects and educational workshops. The team can learn about GPS, digital photography, or even forensic science with hands-on lessons at the workshop. The lessons are given by various career professionals in the technology field. The goals of the state tech team are to introduce 4-H members to various careers in technology, to learn new skills in technology, to network with other 4-H members who

are interested in technology, and to complete a community service project that is technology related.

Extension Program Results and Accomplishments

Output Indicators

- 4 Number of Robotics Programs.
- 10 Number of GPS Programs.
- 3 Teens Teaching Internet Skills.
- 6 Number of State Tech Team Workshops.
- 10 Number of County Tech Teams.
- 12 Number of Camp or Special Event Workshops.
- 4 Number of Morgan Nick Photo ID Days.
- 4 Number of Photography Workshops.
- 23 Number of Filmmaking Workshops.

Outcome Indicators

The Arkansas 4-H Tech Team has more than tripled its active membership.

Source of Funds

Private donations and registration fees, \$1,000 grant from AUTIS, and \$500 Community Partnership grant from Entergy.

Scope of Impact

Dissemination – The Arkansas 4-H Tech Team is only open to youth 13-19 years of age, but the programs are available to all youth and adults in the state of Arkansas. Materials about the program are available on the web and through the program coordinator.

Scope of Program – The technology program has reached youth and adults throughout Arkansas and the United States.

Programs of Excellence

Community Computer Classes

Success Story – I originally scheduled one three-day (six hours total) beginner computer class that emphasized Microsoft Word and PowerPoint. There was such an enormous interest from the community that I ended up offering three additional computer classes for a total of 30 participants.

All participants completed pre/post tests that rated their comfort level with computers, and some of the comments that were made are as follows:

- “I took a six-week computer course last year and I learned more in these three days than I ever did then.”
- “Your style of teaching is so relaxing...even for those of us who don’t know a thing about computers.”
- “I may not have learned everything there is to know, but you’ve inspired me to get on my computer and learn more.”

General Program Information – The 4-H Tech Team members who worked with me were an enormous help (I could not have done the class without them). They were advised to take the opportunity to disperse amongst the participants and offer guidance on the computers. The most difficult aspect of their job was to use only their words when assisting the students. I even advised the 4-H youth to sit on their hands or clasp their hands behind their backs, anything they needed to do in order to not reach over and manipulate the computer for the student. This was a challenge to the 4-H youth who are so skillful on their computers. They found it a huge challenge and a really wonderful experience.

I have had numerous requests for me to offer more community computer classes – this really is a subject that many people need help on.

Number and Names of Counties or Locations Involved – Lawrence County

Impact Numbers – 30 participants

CES Section Contact Person – Tammy L. Seefeld, County Extension Agent – Interim Staff Chair, 870-886-3741, tseefeld@uaex.edu

4-H Technology Club

Success Story – 4-H members expressed an interest in more technology-related activities, so a special interest 4-H Technology Club was formed.

General Program Information – A 4-H Technology Club was formed, and the club has met six times. Members from several different areas in the county participate in the club's activities.

Members have had an Internet Café Tour and a tour of Larry Shaw Racing, Inc. (where NASCAR cars are built), have participated in the Veteran's History Project by videotaping interviews with seven veterans to be sent to the U.S. Library of Congress, and have conducted a robotics workshop.

Number and Names of Counties or Locations Involved – Independence County

Impact Numbers – 12 members in the County 4-H Technology Club

CES Section Contact Person – Beverly Fountain, County Extension Agent - Family and Consumer Sciences, 870-793-8840, bfountain@uaex.edu

Program Response: Arkansas 4-H Volunteer Core Competencies

Contact: Mike Klumpp, 4-H Youth Development, (501) 671-2105, mklumpp@uaex.edu

Situation

Recruiting, retaining, and successfully supporting Arkansas parents and volunteers in our 4-H program can be both exciting and difficult. It has been recognized that an effective 4-H program requires committed parents, dedicated volunteers, and Extension faculty that work together for the common good of young people. In order for each of these groups to contribute their part, they need to have some basic core knowledge about the 4-H Youth Development Program of the University of Arkansas Cooperative Extension Service.

Stakeholder Input

The hallmark of the 4-H program has been its strong volunteer leadership base. Today many volunteers are not willing to make long-term commitments or volunteer at all unless they have a well-defined set of expectations. For these reasons, a consistent training program with core competencies has been identified as a need for volunteer

development and management in Arkansas. Competencies provide for a fundamental understanding of 4-H Youth Development and assist in creating a strong foundation for educational programming in Arkansas. The newly developed Arkansas 4-H Core Competency Training Curriculum – Unit 1 - **This Is 4-H** and Unit 2 - **Getting the Most Out of the 4-H Experience** – provides the base for training volunteers.

Overview

Extension professionals and 4-H paraprofessionals utilize the training tools found in the Arkansas 4-H Core Competency Training Curriculum – Unit 1 - **This Is 4-H** and Unit 2 - **Getting the Most Out of the 4-H Experience** – to train parents/volunteers in skills needed to effectively carry out assigned roles and responsibilities in planning, conducting, and evaluating local 4-H programs. Unit 1 and Unit 2 guidebook and CD-ROM contain PowerPoint presentations, teaching outlines, parent-volunteer self-study series, newsletter support materials, handouts, and 4-H resource materials.

Extension Program Results and Accomplishments

Output Indicators

During the year, 121 volunteer trainings were held across the state, covering each of the three districts, with 1,175 volunteers being trained.

Outcome Indicators

There was an increase by participants in the knowledge level and awareness of the key components that were covered in both Unit 1 and Unit 2 curriculum. Those key components were History of the Cooperative Extension System, History of 4-H, Local 4-H Clubs, Structure of a County Program, 4-H Project Work, Selecting 4-H Projects, Roles of 4-H Volunteers/Family/Agents, 4-H Public Speaking, 4-H Events and Activities, 4-H Evaluation and Recognition, 4-H Record Keeping, and Leading a 4-H Project Group.

Source of Funds

1862 Smith-Lever Funds.

Scope of Impact

Dissemination – The Arkansas 4-H Volunteer Core Competencies Curriculum material is made available by county Extension agents to Arkansas 4-H volunteer leaders, parents, and 4-H teen leaders. Unit 1 - This Is 4-H and Unit 2 - Getting the Most Out of the 4-H Experience guidebooks and corresponding CD-ROM contain PowerPoint presentations, teaching outlines, parent-volunteer self-study series, newsletter support materials, handouts, 4-H resource materials, and evaluations. Counties make the materials available

through volunteer trainings, newsletters, displays, self-studies, web pages, and other correspondence methods.

Scope of Program – 1) State Specific: All 75 counties in Arkansas have had Extension faculty and key volunteers participate in training and are providing opportunities for other clientele to receive additional training in identified competency areas. 2) Multistate: Mississippi has adapted the Arkansas curriculum. Training for Mississippi was conducted by Arkansas 4-H faculty.

Programs of Excellence

4-H Core Competence Leader Training

Success Story – Logan County increased leaders from 39 in 2003 to 69 in 2004. These Leaders served 12 clubs and 208 members. It made a difference in our ability to attract and keep new leaders. Instead of being overwhelmed by the task of leading, new people have some training and past leaders to mentor.

General Program Information – A change in leadership in 4-H clubs prompted a need for training for new 4-H leaders. A number of clubs were losing existing leaders due to their children graduating out of 4-H. This caused a couple of clubs to consolidate, along with the creation of one new club. Training was needed. Five hours of training were provided for leaders from core competency curriculum. Previous leaders have continued involvement to coach the new leaders.

Number and Names of Counties or Locations Involved – Logan County

Impact Numbers – Increase in leaders from 39 to 69 in one year. 12 clubs comprised of 208 members.

CES Section Contact Person – Sheila Brandt, County Extension Agent – Staff Chair, 479-963-2360, sbrandt@uaex.edu

Program Response: Building 4-H Clubs

Contact: Brian Helms, Instructor - 4-H Youth Development, (501) 671-2289, bhelms@uaex.edu

Situation

Too few young people grow up experiencing key ingredients for healthy development. They do not experience encouragement from adults or building sustainable relationships

with their peers. Many have too little to do that is positive or constructive. A recent Montana State University study shows proof of just how important 4-H is to the positive development of young people. The research results revealed that youth who participated in 4-H for more than a year are significantly better off than youth who did not participate in the program. 4-H clubs represent the best opportunity for long-term meaningful youth development.

Stakeholder Input

Stakeholder input was sought through the utilization of the county 4-H expansion and review committees, county Extension councils and the formation of a state team to address the need to increase the number of 4-H clubs in the state of Arkansas. These groups used a discussion and priority-setting process. In addition, the 4-H program underwent an external program review, which indicated the need to enhance clubs and volunteer training.

Overview

Addressing the need to involve youth in positive out-of-school experiences, the drive to focus on increasing the quality and number of organized 4-H clubs, “Building 4-H Clubs,” was conceptualized. This program focused on organizing new 4-H clubs and groups in after-school settings, recruiting and training 4-H volunteers, marketing 4-H, and providing recognition to 4-H members.

Extension Program Results and Accomplishments

Output Indicators

- 1 In-service training for new agents and program assistants was held.
- 135 4-H events were held to enroll 4-H members.
- 9,357 Individuals participated in 4-H enrollment fairs/events/activities.
- 8 Volunteer trainings held on marketing 4-H.
- 33 Volunteers attending training on marketing 4-H.
- 1,176 Organized 4-H clubs and groups.
- 110 School-age child care units reported.
- 3,796 Youth participated in after-school programs.

- 5,649 Youth volunteers trained.
- 2,708 Adult volunteers trained.
- 942 Other adults trained.
- 25 Collaborative efforts with faith-based and civic group/organizations to organize clubs were held, with 784 people participating.
- 134 Organizational meetings were held.
- 10 Volunteer recruitment events were held.

Outcome Indicators

- County Extension agents serviced an average of 5.8 organized clubs and groups per agent in the state.
- 150 Volunteers became Certified Volunteers after participating in three training courses.
- 4-H volunteers contributed an average of 192 hours per year for a total of 1,444,728 hours of service by adult volunteers.
- 4-H youth volunteers contributed an average of 48 hours per year for a total of 58,080 hours of service.
- Arkansas 4-H was honored by the Arkansas Department of Volunteerism for the high number of volunteer hours contributed.

Source of Funds

Smith-Lever Funds 3b and 3c; a Rural Youth Development Grant was obtained for the 4-H After-School program.

Scope of Impact

Dissemination – Program is available to all 75 counties. The Arkansas 4-H Volunteer Core Competency Curriculum (two notebooks, plus three CDs) was made available to all participants in the district trainings. Each county had two faculty members participate in the training. This curriculum was adapted for Arkansas (originally prepared in Oklahoma) by Mike Klumpp, associate professor - 4-H Youth Development. The 4-H L.I.F.E After-School notebook and activity kit was developed by Mike Klumpp and

Connie Phelps. These materials were distributed to participants in the training. In addition, the participants received the national 4-H After-School curriculum kit. Counties participating were Pulaski, Cross, Benton, Boone, Bradley, Carroll, Conway, Craighead, Dallas, Hempstead, Independence, Jefferson, Lee, Madison, Ouachita, Poinsett, Randolph, Searcy, Sebastian, Sevier, Washington, White, Woodruff, and Yell.

Scope of Program – State specific – available to all 75 counties in Arkansas.

Programs of Excellence

4-H Club Expansion

Success Story – It's becoming a big challenge in St. Francis County to find parents and volunteers to work with youth after hours. The 4-H committee recommended that the county Extension agent follow up on some requests for more 4-H school programming in the 3rd- through 6th-grade classes in the Forrest City and Palestine/Wheatley school districts. As a result of school programming and 4-H participation in several community projects, eight school clubs were organized with 4th- and 5th-grade students.

Six youth have become involved with a community club to continue 4-H work throughout the summer. Three youth who were already enrolled in a community club became more active as a result of their participation in the school club program. Twenty 4-H members worked on presentations for the County O-Rama public speaking activity. Three went on to Regional competition and were excited that they got a ribbon. Several parents came to the after-school program at the community center to find out how they could help their child in their 4-H efforts and goals. In addition to the increased membership and participation in the county 4-H program, several community youth programs saw increased attendance and participation from both youth and parents as a result of the programs in the school club meetings. School staff support, from the classroom teachers to the principals, was outstanding.

As a result, St. Francis County has a stronger 4-H club program and a stronger coalition for youth programming. Requests for 4-H clubs in other schools have been made by parents and school staff. Plans are to start one at the Middle School in Forrest City with 5th-grade students as the core group.

Number and Names of Counties or Locations Involved – Forrest City and Palestine/Wheatley school districts in St. Francis County, Arkansas

Impact Numbers – Eight in-school clubs were formed at Stewart Elementary in the Forrest City School District. Six members continued participation throughout summer. A stronger base of support for 4-H programming exists now in the schools.

CES Section Contact Person – Stephanie R. Bryant, County Extension Agent - Family and Consumer Sciences, 870-261-1730, sbryant@uaex.edu

River Valley Youth Get Hooked on Fishing!

Success Story – Arkansas is well known to be a fisherman’s paradise. This basic fact is the impetus for the 4-H/All-American Kids’ Fishing Derby held at Carol Ann Cross Park in Fort Smith. This program relies heavily on volunteer efforts in the community and resulted in the participation of 177 youth and their parents. These youth, many from the city, get a chance to get exposed to fishing and the outdoors in a positive, supervised way. This is a great opportunity to promote 4-H in under-represented audiences. Each participant fills out a registration form and receives information about 4-H programs in Sebastian County.

Through donations from local sponsors, we are able to offer youth prizes, snacks, and drinks. This helps to increase the excitement for the youth. In addition, the lake is stocked for the occasion by the Arkansas Game and Fish Commission so that the success rate is greatly improved.

Volunteers from the Sebastian County 4-H Foundation, Wal-Mart, Master Gardeners, and local 4-H clubs help to make this popular event possible.

General Program Information – Youth are exposed to fishing and outdoors in a positive experience and receive information about 4-H. Volunteers help to conduct the activity, and donations from local sponsors cover the costs of the activity.

Number and Names of Counties or Locations Involved – Sebastian County

Impact Numbers – 177 youth participants and parents were exposed to fishing and outdoors in a positive experience.

CES Section Contact Persons – Dustin Blakey, County Extension Agent - Agriculture, 479-484-7737, dblakey@uaex.edu

Teens Strengthen Program

Success Story – At the age of 12, 4-H members tend to drop out of 4-H or they become inactive. At this age, 4-H members and other youth need to be provided opportunities to develop their leadership skills and provide for their communities. In the process of doing this, they deepen their love and commitment to the 4-H program.

The Craighead County 4-H Teen Leadership Club was organized as a means of keeping current teens enrolled in 4-H and also as a recruiting tool for other teens. During the first meeting, the group discussed the need to have more youth involved at the state level in 4-H activities. They also wanted to develop a focus to their local program so they would be visible and results could be seen from their work. The group voted to focus in the fine arts area. The first project the group undertook was to work with the local foundation of arts. They provided volunteer labor to fold and hand out programs during a performance. One of the members wrote a play which focused on the results of drunk driving. During the summer, the group worked with Cardiology Associates to fold notecards for the Red Dress Event.

Ten 4-H members chose to participate in the Teen Leader Club. Membership was recruited from the current clubs and also from the Junior Leadership Academy which Extension co-sponsors.

Our program struggled during the first few months. The group has now decided to focus on technology. With this focus, it will not matter if one person is able to attend or 20 – the program can go on. Recently a workshop was held on movie making. There were six youth present that were not currently in 4-H. It is hoped that the technology focus will continue to serve as a way to entice youth into the program.

General Program Information – The Craighead County 4-H Teen Leadership Club was organized as a means of keeping current teens enrolled in 4-H and also as a recruiting

tool for other teens. During the first meeting, the group discussed the need to have more youth involved at the state level in 4-H activities.

Number and Names of Counties or Locations Involved – The 4-H members who are involved in the Teen Leader Club are from the Jonesboro, Nettleton, and Westside areas of Craighead County

Impact Numbers – As a result of the ability to focus on teen needs the following occurred: 1) two members became camp counselors, 2) two members attended Farm Bureau Leadership Camp, 3) six members attended state O-Rama, 4) two members attended Teen Leader Conference, and 5) one teen was named Ambassador.

CES Section Contact Persons – Martha May, County Extension Agent - Family and Consumer Sciences, 870-933-4565, mmay@uaex.edu

Education – An Important Part of 4-H!

Success Story – Homeschooling children is becoming very popular in Arkansas. According to the Arkansas Homeschool Office, Arkansas had 13,168 homeschooled youth during the 2003-2004 school year. White County contributes 4.3 percent of the state's total with 571 students.

Youth who are homeschooled and interested in extracurricular activities have to look throughout the community for opportunities. 4-H is a wonderful organization for these students to be involved in. In White County, we have a 4-H club whose total membership is homeschooled students. They meet twice a month during the day and incorporate education in the meeting to help meet school requirements.

The White County Homeschool 4-H Club has succeeded in making education a fun part of a 4-H meeting. The Homeschool 4-H Club's membership is 95% Cloverbuds, 4-H'ers ages 5-8, but that doesn't stop them from running the business meeting, conducting community service projects, or promoting 4-H any chance given.

Over the past year, the White County Homeschool 4-H Club has been very active. The members gathered at a local sports complex to hand out 4-H pencils and brochures to promote 4-H. As a community service project, the members caroled Christmas songs at a local retirement center and cleaned up a local park.

Education is a huge focus for the Homeschool 4-H Club. The club hosted meteorologist Ed Buckner from KTHV Channel 11. Mr. Buckner presented a program on severe weather and storm safety to an audience of 69 people.

The members of the Homeschool 4-H Club are an Arkansas Stream Team thanks to

another guest speaker, Stephen O'Neal of the Arkansas Game and Fish Commission. Mr. O'Neal came twice. On the first visit, the club took a field trip to a local creek, and, under Mr. O'Neal's supervision, performed a chemical analysis of the water. On a separate occasion, they returned to the creek and performed a "bug kick" to collect and analyze the insects and microscopic animals living in the creek.

General Program Information – The White County Homeschool 4-H Club is a wonderful example to other 4-H clubs and youth throughout the county. The club provides youth who are homeschooled an opportunity to become involved in the community and meet other homeschooled students from across the county.

Number and Names of Counties or Locations Involved – White County Homeschool 4-H Club serves all of White County and has 29 members.

Impact Numbers – White County Homeschool 4-H Club has 29 members.

CES Section Contact Persons –Amber Hairston, County Extension Agent - Family and Consumer Sciences, (501) 268-5394, ahairston@uaex.edu

Program Response: Citizenship...Washington Focus

Contact: Connie S. Phelps, Assistant Professor - 4-H Youth Development, 501-671-2065, cphelps@uaex.edu

Situation

Because of recent national events, there is a renewed patriotism among youth in Arkansas and an interest in gaining knowledge of the workings of government.

Stakeholder Input

Agents and leaders who accompany the delegates to Washington, DC, for this event completed an evaluation of the event. The ratings from this evaluation are consistently high.

Overview

The Citizenship...Washington Focus (C...WF) program is designed to teach young people to be active, responsible citizens and leaders. This is accomplished through the use of workshops, dynamic speakers, committee work, field trips, and social events. Delegates to this program saw government in action and explored rights, responsibilities and heritage while considering what action they would take in their own communities after the trip. The C...WF program included a visit to Capitol Hill where the delegates had the opportunity to visit with their Congressional delegation. Each 4-H'er files a plan of action with their county agent, outlining ideas for their leadership role at home in some area of need in their community.

Extension Program Results and Accomplishments

Output Indicators

43 Arkansas 4-H members, two volunteer leaders, and two county Extension agents attended the nine-day C...WF trip to Washington, DC.

5,897 Arkansas youth received citizenship education, according to the ES-237 report.

Outcome Indicators

25 Delegates improved their citizenship competency scores as measured by pre- and post-testing.

40 Youth delegates turned in a plan of action of what they planned to do in their local community as a result of the C...WF experience.

Source of Funds

The program is funded by participant fees managed by the Arkansas 4-H Foundation.

Scope of Impact

Dissemination – Program is available to all counties statewide. Information is available on the UAEX web site and through internal communications.

Program Adoption – Participants in this program represented 20 Arkansas counties: Benton, Boone, Conway, Cross, Faulkner, Garland, Hempstead, Hot Spring, Independence, Jefferson, Johnson, Lawrence, Lonoke, Marion, Phillips, Searcy, Sebastian, Union, Washington, and Woodruff.

Program Response: Developing Youth

Contact: Darlene Z. Baker, State Leader - 4-H Youth Development, (501) 671-2064, dbaker@uaex.edu

Situation

In an increasingly complex and competitive world market, the human capital of the United States is its most important resource. And while young people under 18 years of age represent only 26% of the population, they represent 100% of America's future. Yet, too many youth are reaching adulthood unprepared to be productive workers, effective parents, or responsible citizens.

Stakeholder Input

Using a discussion and priority-setting process, the County Extension Councils in 100% of Arkansas counties have identified developing youth as a major emphasis for their long-range educational programs. Educational programs within the 4-H program for youth are designed to provide youth with positive opportunities to learn and interact with peers and adults and to 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, and Agriculture and Natural Resources.

Overview

The 4-H youth development program promotes a focus on positive youth development. Positive youth development is a process which prepares young people to meet the challenges of adolescence and adulthood through a coordinated, progressive series of activities and experiences which help them to become socially, ethically, emotionally, physically, and cognitively competent. Positive youth development addresses the broader developmental needs of youth, in contrast to deficit-based models that focus solely on youth problems. This approach embodies a wide array of programs. Recent research studies have shown that when young people are provided safe, structured, supervised, and healthy activities in which to participate, they are less likely to become involved in the high-risk, unhealthy behaviors that can delay or derail positive development and are more likely to obtain a broad range of competencies.

Extension Program Results and Accomplishments

Output Indicators

8,240	Number of clubs/units in which youth participated.
1,176	Number of organized clubs/units in which youth participated.
129,817	Number of youth who participated in clubs/units.
18,968	Number of youth who participated in organized clubs/units.
657	Number of educational programs held for youth that target basic life skills.
17,964	Number of youth who participated in educational programs designed to teach basic life skills.
465	Number of youth participating in adventure-based programs.

Outcome Indicators

129,817	Number of youth who reported working in one or more educational project areas.
989	Number of youth spending one or more hours a week in providing service to their community or others.
88	Number of youth who reported increased ability to work as a team after participation in adventure-based learning experience.
34	Number of youth who reported increased ability to set goals after participation in

adventure-based learning experience.

- 859 Number of youth volunteers conducting educational programs.
- 4,064 Number of youth serving in leadership roles at the club or county level.
- 87 Number of youth serving in leadership roles at the state level.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Statewide availability of program to interested youth and adults. 4-H program information available through UAEX web site.

Program Adoption – All 75 counties in Arkansas conduct a 4-H Youth Development program.

Programs of Excellence

Helping Hands Make a Difference

Success Story – Rose Creek 4-H “Helping Hands” club helped build a new community building for the Rose Creek community in Perry, Arkansas.

General Program Information – The Rose Creek community was in need of a local meeting place. The Rose Creek 4-H assisted community volunteers in cleaning the site for a new building as well as constructing the new building. There is now a community building for local organizations and people to meet in.

Number and Names of Counties or Locations Involved – Perry County, Rose Creek Community

Impact Numbers – Entire community of Rose Creek benefits (population 262).

CES Section Contact Person – Lucy Williams, County Extension Agent – Family and Consumer Sciences, 501-889-2661, lawilliams@uaex.edu

Community Garden With Youth

Success Story – In an effort to beautify the downtown area of Helena, The Gardens of E.D.E.N. (Empowering Development through Education and Nutrition) was organized

through a network of organizations committed to creating long term sustainable solutions to address: 1) inadequate nutrition, 2) lack of safe, positive activities and gathering places; and 3) inaccessible hands-on health learning sites.

General Program Information – The goal of The Gardens of E.D.E.N is to engage youth in a fun, healthy, educational community endeavor that will increase positive nutritional choices and decrease the future health risk of participants.

One of the aims is to offer opportunities for hands-on learning and positive extracurricular activities for youth.

Three workshops at the Community Garden work site were conducted with youth of the KIPP Delta College Preparatory School. The workshops were done in procession according to growth. The first workshop was on “Planting for Transplants,” showing the students how to begin transplants inside the greenhouse using small transplant trays. The second workshop was on “Transplanting,” showing the students how to care for the transplants, and the third workshop was on “How to Transplant,” showing students how to actually establish plants from a greenhouse setting to the actual garden setting. All work was hands-on, and every student had their own personal try of vegetables and/or flowers to care for from transplanting in trays to transplanting in an actual garden setting.

Number and Names of Counties or Locations Involved – The city of Helena in Phillips County.

Impact Numbers – 29 students were reached as a result of these workshops. KIPP DCPS students work in the garden weekly to help maintain the garden, continually learning through hands-on activities about gardening and its benefits.

CES Section Contact Person – Shawn Payne, County Extension Agent - Agriculture, (870) 338-8027, spayne@uaex.edu

4-H Youth Garden

Success Story and General Program Information – Oak Grove Commons Apartment Complex in Faulkner County had a need for some after-school and summer activities for the youth at the facility. Most of the youth at the facility live in single parent homes, and it is a low-income housing facility. The youth did not have any activities provided through the facility, so the apartment manager felt there was a great need for some type of program. The apartment manager was very familiar with the 4-H program because she was involved in the program growing up. She knew that she would like to have 4-H activities available for the kids and had some type of gardening program in mind. The apartment complex has youth of all ages, and it is a captive audience for any programs that are provided.

4-H members and leaders, in conjunction with the Faulkner County Master Gardeners, worked with the management of the facility, parents, and youth to develop a youth garden program. Ten 4' X 8' raised beds were built in the front of the apartment complex for everyone to see when they drive into the facility. Master Gardeners are in charge of the educational garden programs at each weekly meeting, and they provide a “Veggie of the Week” for the kids to learn more about. The kids learn about the vitamins and nutrients the vegetable provides, and they get to taste the vegetable in different foods that are prepared by the Master Gardeners. They have tasted many of the vegetables in all kinds of soups, casseroles, and desserts. Some of the foods they have tasted include pickled okra, sweet potato pie, gazpacho, marinated carrots, baked beans, raw celery with cheese and peanut butter, potato soup, carrot cake, and mixed lettuce from their garden. The kids tell us the different kinds of vegetables that they would like to plant, and then they are each given a spot in the garden; therefore, each person determines what they want to plant in their area. 4-H leaders and 4-H members assisted with the development of the program and continue to assist with the weekly meetings. 4-H members come in and work with the youth during the weekly garden time.

In conjunction with the garden, a 4-H club has been started at the facility. 4-H Teen Leaders assisted with the development of this club, and they help with the maintenance each month. Teen Leaders are in charge of the group demonstrations to help the children become familiar with how to do a method demonstration and illustrated talk. Other topics that are covered in the 4-H club include tobacco, alcohol, and drug prevention; character traits; and nutrition.

This program is held at the Oak Grove Commons Apartment Complex in Conway. In addition to the Extension office staff, Master Gardeners, 4-H'ers and 4-H leaders from across the county assist with the project.

Since the program began in March of 2004, 53 children have been reached, and 14 different Master Gardeners have helped with the program. The kids have learned how to

have a vegetable garden, and they have also learned about the negative things that can attack their plants such as aphids, fire ants, and tomato viruses.

This project has really grown since it was started in March of 2004. The kids enjoy all of the activities and learn many new things that they might not otherwise have access to. Since the 2004-05 school year has started, the garden has gained approximately 12 new members. The kids get off the bus on Mondays ready to garden and learn more about vegetables. Some quotes from the kids who are involved in the garden include “I love the garden!” and “I have learned so many things in the past several weeks about the garden.” We are all very excited about the garden project and all of the potential that it possesses!

Number and Names of Counties or Locations Involved – Oak Grove Commons Apartment Complex in Conway in Faulkner County

Impact Numbers – 53 youth involved, 12 of whom are new 4-H’ers
14 Master Gardeners involved
Establishment of 1 new club

CES Section Contact Person – Callie Mills, County Extension Agent - 4-H - Family and Consumer Sciences, (501)329-8344, cmills@uaex.edu

Talking About Ducks

Success Story and General Program Information – Youth do not have an understanding of the importance of agriculture in their lives and the value of agriculture to wildlife. 4-H members of Cross County got involved in the Rice for Ducks program, had an opportunity to learn more about wildlife, and were rewarded for their efforts.

Increasing the participation in the Rice for Ducks program was the objective of setting up a meeting of 4-H members and parents with the coordinator of this program. Everyone learned the details of the program and how they could improve their chances of being a prize-winning participant. Participants also received training in developing a slide presentation on the program and presented the slide presentation to two winter grower meetings with 60 farmers in attendance. They also received training in compiling their records and how to be prepared for an interview on their project.

Number and Names of Counties or Locations Involved – 4-H members from Hickory Ridge and Wynne in Cross County were involved in the program.

Impact Numbers – A total of five youth were involved in the project. They presented their informational slide presentation to two groups of 60 producers and recruited more farmers to be involved in the program in the future. The reports and interview skills they learned earned them a first place in the senior individual division and a first place in the junior team division.

The participating youth improved their speaking skills and learned how to develop a presentation. They also learned the importance of keeping good records of their work and how to present themselves and their information at an interview. More 4-H members are enrolling in this project and are recruiting more rice farmers to be involved in this project.

CES Section Contact Person – Richard A. Klerk, County Extension Agent – Agriculture, 870-238-5745, raklerk@uaex.edu

4-H'ers Learn Recordkeeping Skills for Life

Success Story and General Program Information – Records are an important part of a successful life, whether running a farm, applying for a loan or trying to get a job. Young people in Newton County are much better prepared to be successful because of the recordkeeping skills learned through the 4-H record book program.

The goal was to increase the number of young people participating in the 4-H record book program on the county and district level. This involved multiple approaches: club record book workshops, adult leader record book training, individual attention for each 4-H'er participating, and a reward trip for those that participated.

Each of the four community clubs held workshops in the county.

College grants and job applications are to be feared no more – because Newton County 4-H'ers have recordkeeping skills for life!

Number and Names of Counties or Locations Involved – Newton County

Impact Numbers – 81% of the young people trained in record book preparation actually turned in record books for county and district competition. 22 young people participated this year, increasing from eight participants in the previous year.

CES Section Contact Person – Jack Boles, County Extension Agent – Staff Chair, 870-446-2240, jboles@uaex.edu

Environmental Activity Day

Success Story and General Program Information – Youth need to understand how their actions impact our environment. Environmental education programs teach youth how to be good stewards of the earth.

An Environmental Activity Day was conducted to teach youth about how they affect the environment and how the environment affects their lives. Youth were educated about current environmental problems and how they could help prevent new problems. Program topics were recycling, composting, water wonders, packaging and making paper. The Environmental Activity Day was conducted at the Ozark Fair Building.

Franklin County 4-H members, parents, leaders and other guest youth attended the Environmental Activity Day. Missy Stubblefield, Charleston 4-H leader; Robert Hunter, ADEQ; and Suzanne Hirrel, LRSO-Extension conducted workshops at the Environmental Activity Day.

103 adults and youth (82 youth) learned about the affects they have on the environment and how the environment affects their lives. They learned how to recycle, how to worm compost, and how to make paper.

As a result of the Environmental Activity Day, youth and adults will be good stewards of the environment. In 2005, we are going to conduct another environmental awareness activity for youth and an environmental education workshop/training for teachers.

Number and Names of Counties or Locations Involved – Ozark Fair Building in Franklin County

Impact Numbers – 103 adults and 82 youth. In addition, an indeterminate number will be affected by workshops held in 2005 as a result of this training.

CES Section Contact Person – Cindy Ham, County Extension Agent – Agriculture, 479-965-2272, cham@uaex.edu

Petting Zoo Provides Leadership and Fun!

Success Story and General Program Information – **Although Clark County is a mostly rural county, many young people here do not have the opportunity to see livestock up close. The County Fair Petting Zoo gave kindergarten through second graders that opportunity, while at the same time providing needed leadership opportunities to 4-H members. 4-H members made available dairy and beef heifers, hogs, lambs, goats, ducks, chickens, and rabbits for the youngsters to pet and interact with. Of the nearly 600 participants, many of them had never seen sheep, goats, or hogs up close. Twenty-two 4-H members helped with the Petting Zoo.**

The County Fair Petting Zoo seeks to provide hands-on experiences with livestock for youth who may not have the opportunities otherwise. It is held at the Clark County Fair Grounds during the County Fair.

This was offered county-wide. Specifically, Arkadelphia, Gurdon, and Christian Academy Schools attended, as well as several homeschoolers.

Nearly 600 youngsters came through the petting zoo. Twenty-two 4-H'ers gained leadership experience, and several 4-H parents and volunteers helped as well.

The participants were very excited and interested in learning about the animals. Hopefully, future 4-H livestock projects will be born of this exposure to the animals.

Number and Names of Counties or Locations Involved – Clark County, County Fairgrounds. Involved Arkadelphia, Gurdon, Christian Academy, and homeschoolers in the area.

Impact Numbers – 22 4-H'ers hosting nearly 600 youngsters.

CES Section Contact Person – Amy Simpson, County Extension Agent - 4-H - Agriculture, 870-246-2281, asimpson@uaex.edu

The Urban 4-H Mini Camp

Success Story and General Program Information – Children in Lee County did not have anything to do for the summer to keep them out of trouble.

An Urban 4-H Mini Camp taught the children different ways to deal with everyday lifestyles. The programs were held at the Marianna Housing Authority and Anna Strong Circle housing project.

Children learned the correct way to sit at a dinner table and how to use their silverware; the safest way to prepare food and keep it safe; how to identify different weeds; how to care for pets; how to correctly use a fishing rod and the different rules and guidelines for operating a bicycle.

Number and Names of Counties or Locations Involved – Area youth from Marianna and Lee County participated in the mini camp.

Impact Numbers – 166 children participated.

CES Section Contact Person – Lazaro J. English, County Extension Agent – Staff Chair, 870-295-7720, lenglish@uaex.edu

Youth Development Seminars

Success Story and General Program Information – This pro-social youth-at-risk program began as a need identified by the 4-H and Youth Committee of the Extension Advisory Committee. They felt that our youth were lacking in pro-social behavior due to busier family schedules, both parents working outside the home, and more single parent families. These changes in the family structure have had a significant impact on our community through high rates of teen pregnancy, juvenile delinquency, school dropouts, gang activity, youth crime, etc. Since these problems were not being addressed in the home, it was assessed to be the responsibility of the community to help educate our youth. To prevent problems of this nature, we decided we must reach youth at the junior high age. Our goals are:

- a. for students, with the guidance of community educators, to assess the advantages and disadvantages of being involved in at-risk behavior and learn to make positive decisions about situations that affect them.
- b. for students to realize the importance of setting goals for themselves and to motivate them to make the most of their potential.

We collaborated with principals and teachers from an urban junior high to present an eight-hour program for 518 7th-grade students. We began and ended the program with general assemblies featuring motivational speakers and entertainment by Jefferson County 4-H members.

Students were rotated through 5 of 16 seminars covering such issues as Self-Esteem, Teen Pregnancy, Sexually Transmitted Disease, Aids, Gangs, Youth and the Law, Suicide, Coping with Death, Substance Abuse, Drinking and Driving, Child Abuse, etc.

Seminar speakers included educators from city and state police departments, the Attorney General's Office, county and state sheriff's departments, the Health Department, ACCESS, RAIN (AIDS), Juvenile Court, and educators from other community organizations. 4-H'ers took leadership roles in conducting the event. This was a community collaborative effort between the Extension Service, local school administration, teachers in Southeast Junior High and community agencies, with Extension Service taking the lead role in planning and coordinating the program.

After meeting with the committee, the county agent - 4-H and two 4-H program assistants planned the program, scheduled speakers, arranged for refreshments, lunch and speakers' gifts and wrote a grant for \$800 to cover the cost of the program. The school arranged for facilities, divided the students into seminars and printed programs.

We reached 479 students and 49 adults in the 7th grade of a predominately black school in Pine Bluff which has a high percentage of at-risk behavior. The teachers were impressed with the quality of the program and very enthusiastic about conducting the

program next year, where the students will have the opportunity to participate in different seminars.

Five hundred and ten students, with the guidance of trained professionals, assessed the advantages and disadvantages of being in gangs, taking part in unprotected premarital sex, drug and alcohol abuse, and juvenile crime. Student feedback indicated an improvement in these areas. We have had positive comments from students in the program and still hear comments from students in past programs.

This program has been financed through a grant from the Tobacco Coalition and United Way funds through the 4-H program. This was a collaborative effort of the Cooperative Extension Service, 4-H Program, local agencies, community leaders, 4-H Teen Leaders, teachers, and school principals.

Number and Names of Counties or Locations Involved – Southeast Junior High School in Jefferson County

Impact Numbers – 479 at-risk youth and 49 adults

CES Section Contact Person – Carol Scaramuzza, 870-534-1033, cscaramuzza@uaex.edu

Program Response: **ExCEL: Experience the Challenge Experience the Leadership**

Contact: J. J. Pitman, 4-H Youth Development, (501) 821-6884, jpitman@uaex.edu; Burnie Kessner, 4-H Youth Development, (501) 821-6884, bkessner@uaex.edu; Eric De Vries, 4-H Youth Development, (501) 821-6884, edevries@uaex.edu

Situation

As our communities become more detached, the need for leadership skills increases. Academic skills are pushed to the forefront of education in today's society. There is an increasing need for communication and social interaction skills. ExCEL provides a forum which enhances and encourages these educational opportunities.

Stakeholder Input

Participants in the ExCEL program typically offer input on a voluntary basis. Participant responses are collected by many forms, e-mail, evaluations, thank you letters, and via phone. Input was selected through evaluation.

“This program has proven it can work with people of all ages and varying personal abilities.”

Jordan Johnson

“For the past five years we have used the ExCEL program, at the Ferndale 4-H Center, to develop teamwork in our young leaders. The course has always exceeded our expectations.”

Bill Noland

Overview

The main objectives of ExCEL are to:

- Help individuals and groups increase trust in themselves and others.
- Develop self-confidence in participants.
- Develop team concept and spirit in self and group.
- Help participants increase motivation and personal performance.
- Teach the value of trust and cooperation and how these qualities are important in everyday life.
- Translate leadership skills immediately into real life situations (communication, working in groups, decision-making, understanding self, and management).

The ExCEL program is designed to give groups the opportunity to develop creative problem-solving skills and to discover the value of working with others to achieve goals. ExCEL targets older youth and adults. ExCEL can be a valuable tool for youth and adult interpersonal and organizational growth by providing a tailor-made program to meet the needs of youth and adult organizations. The ExCEL program is designed to build self-confidence, teach trust and cooperation and directs participants to develop positive solutions to existing problems. ExCEL uses initiatives, low initiatives, a high ropes course, and rock climbing walls to help groups achieve their personal and group goals.

Extension Program Results and Accomplishments

Output Indicators

3,570 participants participated in the program in 2003-04

of Activities/Participants

163 activities with 3,570 participants

Description of Activity, Program, Product

4- or 8-hour Challenge course programs

Outcome Indicators

- 1997-98 1,550
- 1998-99 2,800
- 1999-00 2900
- 2000-01 3,500
- 2001-02 3,540
- 2002-03 3,254

Source of Funds

Funds for the ExCEL program are from the Cooperative Extension Service, University of Arkansas 4-H Foundation and participant fees. This year grant funds were secured from NatureMapping, Arkansas Game and Fish Commission, and 4-H Urban and Rural funds.

Scope of Impact

Dissemination – The ExCEL program is available to all eligible persons above the age of 12 regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status. Information is available through the web. Brochures are available at the 4-H Center and via mail upon request.

Scope of Program – Program available to all counties. Due to facilities, all programs are located at the Arkansas 4-H Center.

Program Response:

4-H Responsible Environmental Stewardship-Quest (4-H RES-Q)

Science Enrichment Education for Kids (SEEK)

Summer Day Camp

NatureMapping

Contacts: Leslie H. Gall, 4-H Youth Development, 501-821-6884, lgall@uaex.edu;
Burnett L. Kessner, 4-H Youth Development, 501-821-6884, bkessner@uaex.edu

Situation

Numerous children live in an urban setting and view the outdoors through computers, television and textbooks instead of venturing outside. The experiences children have will help define their attitudes as adults. In turn, these adults will affect the future of our natural state. As adults and educators, we are responsible for teaching our youth about the

importance of protecting, using and conserving our natural resources, thus ensuring a healthy environment for all living things.

Stakeholder Input

“We can move the classroom to Ferndale and they get a lot of hands-on experience. We bring our support staff, music, PE teacher and librarian, and they incorporate what they learn here into their curriculum when they get back to school.”

Leara Beth Carmichael, Teacher, Cabot Central Elementary, commenting on the school field trip section of 4-H RES-Q

“I just wanted to tell you how impressed I was with the first grade SEEK program today. (Nathaniel had surgery earlier this week, but insisted on going today, so I went along as his “shadow” to make sure he didn't overdo it.) I already knew that it was a well-organized program just from the tidbits I've learned from Nathaniel, but after today I can see why it's so successful! Angie and Kelly are great with the kids, and everything is done so well (from their lessons, to lunch, to discipline, etc.) It was quite obvious that they had spent a lot of time in preparation for the class, and their love for the kids was evident as well. I commend you on finding such excellent teachers and for such a quality program that is well worth every penny! Thanks for all your hard work! This homeschooling mom really appreciates all of you!”

Betty Ray, Homeschool parent, commenting on the first grade SEEK class

Overview

4-H environmental education programs at the 4-H Center, such as 4-H RES-Q, allow students to experience the out-of-doors and provide them with environmental facts that will allow them to make decisions and solve problems concerning their role as stewards of the environment. This goal is accomplished through numerous avenues such as 4-H RES-Q, SEEK, Summer Day Camp, and NatureMapping. The mission of the Cooperative Extension Service, University of Arkansas is to help people improve their lives through an educational process that uses research-based knowledge focused on issues and needs. The mission of 4-H is to provide opportunities for youth to acquire knowledge, develop life skills, form attitudes and practice behavior that will enable them to become self-directing, productive, and contributing members of society.

The goals of all of the environmental education programs are:

- To provide learners of all ages a positive outdoor education experience.
- To instill a lifelong enthusiasm, appreciation and sense of responsibility toward the natural world.
- To assist participants in ultimately making informed environmental decisions.

4-H RES-Q: School and Youth Group Environmental Education Field Trips

Our program is a residential environmental education program available to youth as a one-day or multi-day and night program. This program incorporates existing education resources, such as Project WET, Project WILD and Project Learning Tree, into the 4-H RES-Q curriculum. The activities are aligned to Arkansas' science standards. Educators select from 19 classes that allow students to participate in experiential learning activities. A few classes are:

Water Ecology – The Water Ecology class explores how the water cycle affects lakes, springs and streams, as well as interrelationships between plants, animals, macro invertebrates, people and physical features. Students predict, observe and classify components of water ecology. This class increases awareness of the role of water ecosystems in our world.

Forest Ecology – Forests serve as the lungs of the earth. Students explore this concept while learning the life cycle of trees. Sensory experiences and hands-on activities convey appreciation and awareness of the forest as a community of living things and a renewable natural resource.

Canoeing and Hooked On Fishing – Clean water is essential for all living things. Students are instructed in water safety skills for the recreational activities as well as an appreciation for the importance of clean water.

Wildlife – Wildlife explores the diverse animals that inhabit the forest, fields and cities. Ecosystems and habitats are heavily emphasized in this class.

Additional classes include Astronomy, Reptiles and Amphibians, Nature Awareness, Bats and Caves, Entomology, Adventure Games, Orienteering, and several other topics.

Summer Day Camp

The ever-increasing demand for quality summer-time activities for children was a niche in which the University of Arkansas Cooperative Extension Service 4-H RES-Q program fit perfectly. One of the premier outdoor education programs in the state, the 4-H RES-Q

program was ready to offer its fun, experiential education curriculum during a warmer season. Children ages 7-12 years old enjoyed four fun-filled days from 9:30 a.m. to 2:30 p.m. Tuesday through Friday at the Arkansas 4-H Center in Ferndale, Arkansas. Each day's activities revolved around a theme such as Wildlife, Aquatics, Forest Ecology, and Outdoor Adventure. The program repeated for six weeks during the summer.

Science Enrichment Education for Kids

The SEEK program began in the fall of 1999. The program was established to help meet the science needs of homeschooled children and their parents. The program's primary objective is to concentrate on providing hands-on science experience in a fun and safe social environment. We currently have three days of programming (Tuesday, Wednesday, and Friday) with students attending one day a week for 12 weeks during 2004/2005. The program currently has one first grade, two second grade, three third/fourth grade, three fifth/sixth grade, three seventh/eighth grade, and two ninth through twelfth grade classes.

NatureMapping

NatureMapping is a data collection and monitoring program for schools and the public to keep track of nature, by mapping what they observe. A two-year pilot program was conducted, beginning with the 2002/2003 SEEK program, incorporating NatureMapping curriculum into the SEEK program. High school age students met once per week during the 12-week program to study natural resource management topics, mapping, Geographic Information System and Global Positioning System technology, and leadership skills.

Extension Program Results and Accomplishments

Output Indicators

- 7,913 Number of participants in the 4-H RES-Q school and youth groups environmental education field trip program at the Arkansas 4-H Center, March through November 2004.
- 120 Number of participants in the three weeks of the Summer Day Camp program, June, July, and August 2004.
- 204 Number of participants in the 12-week SEEK program, winter of 2004/2005.
- 15 Number of participants in the NatureMapping program, winter of 2004/2005.

Source of Funds

4-H environmental education programs at the 4-H Center are a youth development program of the University of Arkansas, Division of Agriculture, Cooperative Extension Service located at the C. A. Vines Arkansas 4-H Center in Ferndale, Arkansas. Cooperating sponsors for this program include the Arkansas Game and Fish Commission, Arkansas Department of Environmental Quality, Arkansas 4-H Foundation, USDA Ouachita National Forest Service, Entergy, Nucor Steel, Nucor Yamato Steel, EPA, and numerous organizations, industries and individuals from across the state.

Scope of Impact

Dissemination – 4-H environmental education programs at the 4-H Center are available to all youth from across the state through the Arkansas Cooperative Extension Service. The Arkansas Cooperative Extension Service offers its programs to all eligible persons regardless of race, color, national origin, religion, gender, age, disability, marital or veteran status, or any other legally protected status, and is an Equal Opportunity Employer. The information is available on the Internet and through county Extension offices.

Scope of Program – Our programs are based at the Arkansas 4-H Center with some workshops facilitated in other parts of the state. We have participants from Ashley, Craighead, Faulkner, Franklin, Garland, Grant, Hot Spring, Independence, Lawrence, Lonoke, Mississippi, Montgomery, Pulaski, Pope, Saline, and White counties in one or more of the 4-H RES-Q sections.

Program Response: Regional and State 4-H O-Rama

Contact: Priscella Thomas, 4-H Youth Development, 501-671-2059, pthomas@uaex.edu.

Situation

Arkansas youth are provided with an opportunity to exhibit the skills that they have developed through their project work in a variety of competitive and noncompetitive activities at the regional and state levels.

Stakeholder Input

4-H adult volunteers, 4-H members, Extension county agents and specialists were involved in an intensive review of the overall 4-H O-Rama process in August of 2002. The purpose was to listen to the stakeholders and to make any needed revisions in the program. The committee collected input from parents, volunteers, and 4-H members in their respective counties and then shared that input during a six-hour statewide committee meeting. The committee was divided into three subgroups with each group making recommendations to the total committee. The committee's recommendations were shared with administration, and adjustments were made in the areas of scheduling, programming and policies for 2003-2006. However, minor adjustments are made as a result of evaluation response when needed.

Overview

Junior and senior 4-H members have the opportunity to participate in the Regional O-Rama, a one-day event held in each region, and the Arkansas 4-H O-Rama, a three-day event held on the U of A Fayetteville campus. The events are designed to provide youth the opportunity to exhibit the skills they have developed through their project work. It also gives a comprehensive vision of 4-H and offers the opportunity to enhance life skills and acquire knowledge through competitive and noncompetitive activities while experiencing campus life, developing personal relationships, making choices and being recognized in front of peers. Junior and senior 4-H members' skills are displayed through demonstrations and illustrated talks. In addition to competing during Arkansas 4-H O-Rama, the 4-H members have the opportunity to take part in service projects and the Bumpers College picnic lunch and attend the Awards of Excellence Banquet.

Extension Program Results and Accomplishments

Output Indicators

Regional O-Rama

- 154 Number of Extension agents that attended the SE, SW, NE, and NW Regional O-Ramas.
- 33 Number of Extension paraprofessionals that attended the SE, SW, NE, and NW Regional O-Ramas.
- 178 Number of specialists conducting activities and others attending at the SE, SW, NE, and NE Regional O-Ramas.
- 236 Number of 4-H leaders that attended the SE, SW, NE, and NW Regional O-Ramas.
- 744 Number of junior 4-H'ers competing in activities at the SE, SW, NE, and NW Regional O-Ramas.
- 522 Number of senior 4-H'ers competing in activities at the SE, SW, NE, and NW Regional O-Ramas.

Arkansas 4-H O-Rama

- 83 Number of Extension agents that attended State O-Rama.
- 12 Number of Extension paraprofessionals that attended State O-Rama.
- 45 Number of specialists that conducted activities and attended State O-Rama.
- 73 Number of 4-H leaders that attended State O-Rama.
- 499 Number of 4-H'ers from the Southeast, Southwest, Northwest, and Northeast districts that attended State O-Rama.

Source of Funds

The programs are funded by participant fees. These fees are managed by the Arkansas 4-H Foundation.

Scope of Impact

Dissemination – The program is available to all junior and senior 4-H members statewide who are eligible through competition in district-qualifying or state-only competitive activities.

Scope of Program – Junior and senior 4-H members, volunteer leaders, and Extension faculty from all 75 counties have participated in the event.

Program Response: State 4-H Camp

Joshua Wright, 4-H Youth Development, 501-821-6884, jwright@uaex.edu

Situation

Camp experiences have been recognized by child development professionals as valuable in helping children mature socially, emotionally, intellectually, morally, and physically. Camps can make a significant contribution to meeting priority needs of youth. Youth of 4-H age today feel they are too often treated as if they were incapable of making decisions, taking responsibility, acting independently, thinking seriously and having a serious conversation with others. Today's youth are interested in constructive involvement and decision-making. They have the need to be understood by peers and adults and to have a sense of identity. They need to feel productive and have opportunities to develop and express their creativity.

Stakeholder Input

Evaluations completed by student campers.

Overview

Three state camps designed for county 4-H youth participation (ages 9-12), three for youth (ages 13-16), and one camp added (ages 5-9) – known as Bring a Big Person to Camp – were conducted at the Arkansas 4-H Center and at camp areas during June and July. The camping program used 4-H Teen Counselors to assist with supervision of campers, maintain a high level of cooperation and teamwork between counselors and campers, conduct camping programs, mentor young campers, and assist with other duties of the camping program. The educational programs and camping activities were conducted using experiential learning methods, individual and group participation and achievement. Camp was designed not only to allow youth to learn new skills, but also to expose them to opportunities for developing social skills, personal development, developing relationships, building life skills and increasing responsibilities for self and others.

Through this camping program, young people learned to problem-solve, make social adjustments to new and different people, learn responsibility, and gain new skills to improve their self-esteem. One of the many advantages of camping is that it helps young people discover and explore their talents, interests and values. Young people who have the opportunity to participate in camping experiences develop healthier lifestyles and attitudes, experience fewer problems adjusting to social situations and are more likely to

develop an appreciation for exploration and creativity. Camp is one of the most exciting and rewarding experiences of a young person's life. The counselors were provided with a two-day intensive counselor training that helped to prepare them for their duties and responsibilities. Camps were designed around the theme "Life in the Frontier," which introduced campers to a wide variety of 4-H educational subject matter through exploration of the frontier life..

Extension Program Results and Accomplishments

Output Indicators

50	4-H Teen Counselors.
58	Regional Camps.
6	Bring a Big Person Camp.
28	State Equine Camp.
231	State Camp One.
260	State Camp Two.
83	State Camp Three.
716	Total number of campers.
34	Counties whose youth participated in State Camp.
12,888	Hours of camper educational instruction time.
5,570	Hours of camper recreational time.

Outcome Indicators

- Camp evaluations were rated on a 1-5 scale with 5 being the best rating (based on 302 responses out of 652 campers).
- Facilities received an average 3.48 rating.
- Educational Workshops received an average 4.13 rating.

Source of Funds

Primary source of funding was camper user fees.

Scope of Impact

Dissemination – The State 4-H Camp is marketed to county youth ages 9-12 through the county Extension offices across the state. 4-H teens from across the state are eligible to make application for 4-H Counselor positions.

Scope of Program – 34 Arkansas counties used the program.

Program Response: Youth Community Service

Contact: Connie S. Phelps, Assistant Professor - 4-H Youth Development, 501-671-2065, cphelps@uaex.edu

Situation

In an increasingly complex and competitive world market, the human capital of the United States is its most important resource. And while young people under 18 years of age represent only 26% of the population, they represent 100% of America's future. Yet, too many youth are reaching adulthood unprepared to be productive workers, effective parents, or responsible citizens.

Stakeholder Input

Stakeholders are involved at all levels in the development of community service programs. At the local level, clubs work with parent and community leaders to determine needs. Each county involves their county advisory committees.

Overview

Community service has always been an important component of the 4-H program, with adults and youth working together with community organizations. Participating in activities to improve their surroundings empowers youth to make a difference and to connect with the civic life of their communities and country. Recent research reports that youth who are involved in service just one hour or more a week were found to be half as likely to engage in a variety of negative behaviors such as alcohol and drug use, vandalism, and school truancy.

Extension Program Results and Accomplishments

Output Indicators

- 32 Number of community projects implemented by youth.
- 2,321 Number of youth who participated in community service projects.
- 1,126 Number of volunteer hours expended on the 4-H CAN Make a Difference food bank program.
- 10,398 Pounds of food collected via the 4-H CAN Make a Difference program.

Outcome Indicators

- 1,622 Number of youth who reported spending one or more hours a week in providing service to their community or others.
- 15,112 Number of volunteer hours contributed by youth to community service programs.
- \$226,680 Value of volunteer hours contributed by youth to community service programs.

Source of Funds

Smith-Lever 3b and 3c provide support for professionals. Additional program costs are supplied via local clubs and county 4-H foundations.

Scope of Impact

Dissemination – Statewide availability of program to interested youth and adults. Local 4-H clubs and county programs provide opportunities for youth to give back to their communities through service to others.

Scope of Program – Statewide – 11 counties submitted written Community Service Reports. These counties were Washington, Craighead, Greene, Sharp, Sevier, Columbia, Lincoln, Fulton, Logan, Cleburne, and Searcy. In addition, the “4-H CAN Make A Difference” food drive was conducted at the county and state levels. Over 10,398 pounds of food was collected across Arkansas. Food was distributed to the Arkansas Food Bank and local/county food pantries. Additional community service projects conducted were service projects (8) at the annual Teen Leader Conference. A total of 187 youth participated in the Teen Leader Conference service projects: comfort bears, letters to armed forces, 4-H camp workshop supply preparation, Morgan Nick Alert, Care Clothes, and personal care kits.

Program Response: Youth Leadership

Contact: Brian Helms, Instructor - 4-H Youth Development, bhelms@uaex.edu, 501-671-2289

Situation

In an increasingly complex and competitive world market, the human capital of the United States is its most important resource. And while young people under 18 years of age represent only 26% of the population, they represent 100% of America's future. Yet, too many youth are reaching adulthood unprepared to be productive workers, effective parents, or responsible citizens.

Stakeholder Input

Teens – the primary stakeholders – are involved in all aspects of the program planning. The state 4-H officers meet four times a year for program planning. State 4-H officers serve as members of the Arkansas 4-H Foundation (another major stakeholder group, which also meets four times per year). The Arkansas Adult 4-H Volunteer Leader's Association holds two meetings per year and is utilized as a sounding board for programs relating to leadership development.

Overview

The Youth Leadership Program involves working with teens between the ages of 14 to 19 years old. Teens learn and practice leadership skills by participating in a variety of programs. The State 4-H Officer Program involves the election of nine individuals who provide leadership to many of the district and statewide 4-H activities. A two-day training is held for those elected by their peers to provide 4-H officers with the leadership skills they will need to carry out their duties and to begin plans for the Teen Leader Conference. State 4-H officers also meet to plan state activities, participate in promotional activities, and assist with ongoing youth development programs.

In FY04, 55 teens participated in the 4-H Ambassador Program. Candidates for the program must have demonstrated significant accomplishments in their project work, leadership and community service and then go through an interview process demonstrating their knowledge of the 4-H program and ability to promote the program mission and goals. Fifty-one ambassadors and four adults participated in a two-day workshop with the objective of planning the three-day Teen Leader Conference held in June.

A highlight of the Teen Leadership program is Teen Leader Conference. This is a three-day conference for 4-H members ages 14 to 19. The conference is planned and conducted

by state 4-H ambassadors and focuses on specific topics of interest to teens. In 2004, the conference focused on the workforce preparation skills. Participants included 207 youth and 13 adults.

Extension Program Results and Accomplishments

Output Indicators

- 45 Educational programs presented focusing on Youth Leadership and Volunteer Development.
- 48 Educational programs designed to develop youth leadership.
- 142 Training conducted for officer leadership roles in club, county, and community.

Outcome Indicators

- 232 Number of youth volunteers conducting educational programs.
- 8,560 Number of volunteer hours contributed by youth to educational programs.
- 1,028 Number of youth in new volunteer leadership positions.
- 60 Number of youth in new elected leadership positions.
- 184 Number of youth volunteers trained through 4-H and participating in leadership programs.
- 7,220 Youth enrolled in Leadership Development
- 15 Number of youth serving on Advisory Boards/Councils

Source of Funds

Smith-Lever 3b and 3c provides funding for professionals' salaries. Conference fees are participant provided and limited funding is provided by the Arkansas 4-H Foundation.

Scope of Impact

Dissemination – Statewide availability of program to interested youth and adults. 4-H program information available through UAEX web site.

Program Adoption – 24 counties had youth serve in a state 4-H ambassador or state 4-H officer leadership role including Benton, Boone, Clark, Columbia, Crawford, Faulkner,

Fulton, Garland, Greene, Independence, Jefferson, Johnson, Lawrence, Lonoke, Pike, Polk, Pope, Prairie, Saline, Searcy, Union, Van Buren, Washington, and White.

Programs of Excellence

4-H Teen Leadership Conference

Success Story – In June 2004, 207 youth participated in the 4-H Teen Leadership Conference. The three-night/four-day program was designed, organized and implemented by 55 State Officers (9) and Ambassadors (46). The 55 youth were responsible for the behind the scenes working of the workshop, planning and carrying out the responsibilities of registration, assembly and workshops, dance and fun activities, Hall of Fame Banquet (400 members and guests participating) evaluation, closing ceremonies, and selection of workshop topics and speakers. The youth meet in February at the Ambassador Workshop (56 youth) to plan and design workshop content, divide up responsibilities, and participate in the educational workshop training and program design. The Teen Leadership Conference provided youth the opportunity to receive training and curriculum in the areas of workforce preparation, career selection, resumé preparation, and community service.

General Program Information – Teen Leader Conference is totally planned, conducted, and evaluated by the State 4-H Officers and State 4-H Ambassadors.

Locations Involved – Baxter, Benton, Boone, Carroll, Clay, Columbia, Craighead, Crawford, Cross, Faulkner, Franklin, Fulton, Garland, Grant, Greene, Hempstead, Hot Spring, Howard, Independence, Jefferson, Johnson, Lawrence, Lonoke, Madison, Nevada, Ouachita, Pike, Polk, Pope, Prairie, Saline, Searcy, Sebastian, Sevier, Union, Van Buren, Washington, White, and Yell counties.

Impact – The 207 youth who participated in the Teen Leadership Conference have taken the educational workshop materials and presented this information at the local and state level.

CES Section Contact Person – Brian Helms, Instructor - 4-H Youth Development, Little Rock State Office, (501) 671-2289, bhelms@uaex.edu.

Polk County Leadership Roll

Success Story – Polk County has not had a long history and tradition of 4-H work. Many kids grew up as a part of the program over the years, but few took advantage of all the program has had to offer – until now. Polk County can boast of kids who are 4-H leaders in the county and across the state.

The 4-H program builds leadership skills in young people. Many times those skills are

not noticed until that youth graduates high school, goes to college and then returns to the community. Over the past few years, that has changed. Our 4-H teens are out there – out there taking part in what 4-H has to offer, developing skills learned in those activities, and then putting those skills to work. For the past three years, Polk County has had a representative on the state 4-H officer team – a big accomplishment for a county that had very little 4-H participation eight years ago.

The officer team consists of nine 4-Hers elected to office by their peers. This gives Polk County 4-H a great reputation across the state. Not only that, it provides great opportunity for youth to serve the community and state in some very important roles.

We are hoping the younger 4-H members are paying attention to the role models our teens are to them.

General Program Information – 4-H Teen members are taking advantage of statewide leadership opportunities and being recognized for it. These youth are serving as role models for younger youth.

Locations Involved – Polk County

Impact – Polk County 4-H has had a representative on the state 4-H officer team for the last three years.

CES Section Contact Person – Brian Helms, Instructor - 4-H Youth Development, Little Rock State Office, 501-671-2289, bhelms@uaex.edu.

Program Contact Person Carla Vaught, County Extension Agent - Agriculture, 479-394-6018, cvaught@uaex.edu

Junior Leadership Academy Enters Fifth Year

Success Story – During the spring of 1998, tragedy struck one of the schools in our county. We experienced what many schools in the nation experienced – a school shooting. Five people lost their lives that day. In response, four school districts were able to secure funding to begin incorporating many programs that would not only help to develop the mental health of students but also to make the schools a safer place. It was out of this tragedy that funding became available to develop the Junior Leadership Academy.

The goal of the Junior Leadership Academy is to instill in youth the characteristics and skills needed to be a leader in the community. Twice each year 20 students are selected from 6 school districts in the Jonesboro area. The students are from the junior high level. These students spend one day focusing on developing and understanding basic life skills. The next two days are spent visiting the State Capitol and participating in the ExCEL program at the Arkansas 4-H Center.

General Program Information – Junior high school students learn leadership through Junior Leadership Academy.

Locations Involved – Six junior high schools currently participate in the Junior Leadership Academy.

Impact – Each year 40 students participate in the academy. As a result of the program, there are now 320 students who are more aware of their leadership qualities and how they can be utilized in their communities.

CES Section Contact Person – Brian Helms, Instructor - 4-H Youth Development, Little Rock State Office, 501-671-2289, bhelms@uaex.edu.

Program Contact Person – Martha May, County Extension Agent - Family and Consumer Sciences, 870-933-4565, mmay@uaex.edu

Program Response: Youth Poultry Program

Contact: Jerry Wooley, Extension Poultry Specialist, P.O. Box 391, Little Rock, AR 72203, jwooley@uaex.edu, 501-671-2189

Situation

Poultry is Arkansas's largest industry and employer. Our youth are likely to be future employees, leaders and problem solvers in the poultry industry. Yet many young people have a limited understanding of the opportunities available or the skills necessary to realize those opportunities.

Stakeholder Input

Youth programs are a well-established part of poultry Extension. In recognition of the effectiveness of the program, industry clientele regularly sponsor youth events.

Overview

The youth poultry program includes the youth broiler programs, the poultry chain project, the broiler BBQ, the poultry judging contest, and embryology projects. The youth poultry program provides young people with an opportunity to enhance their life skills and learn about the industry. The program also educates youth in life sciences and embryology.

Extension Program Results and Accomplishments

Output Indicators

- 24,725 Laying pullets placed with youth participants.
- 8,000 Broilers placed with youth participants.
- 5 Barbecue contests involving youth participant.
- 14 Judging contests involving youth participants.

Outcome Indicators

- 900 Youth participants learned the principles and responsibility necessary to care for laying birds.
- 300 Youth participants learned broiler care principles.
- 1,050 Youth BBQ participants learned the cooking and poultry product handling techniques.

Source of Funds

Industry sponsorships, local community supporters, participant fees, and Smith-Lever.

Scope of Impact

Dissemination – This program is available to 4-H'ers statewide.

Scope of Program – Statewide programs

Total FTEs

2.04

Total Budgetary Amount

\$44,460.73

KEY THEME:

AGRICULTURAL COMMUNICATIONS

Program Response:

Mass Media Education Programs

Contact: Bob Reynolds, Director of Communications and Marketing, 501-671-2128,
breynolds@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service uses various strategies for providing relevant information to Arkansans. While Extension county agents and content specialists provide information one-to-one or in small group meetings and workshops, there are many Arkansans who can be reached only through mass media. Extension extends its educational efforts into thousands of homes through media outlets and through the Internet.

Stakeholder Input

The content broadcast is provided by specialists and reflects the programmatic focus of agriculture, urban horticulture, family and consumer sciences, 4-H and youth development, community development and public issues. Commercial television and radio stations provided input as to content format needed to reach audiences based upon Arbitron and situations and issues that occur and affect the lives of Arkansans.

A multi-state committee comprised of Southern Region communications and marketing, and information technology directors, specialists and members of the private sector (with expertise in communications and marketing, and information technology) audited in the fall 2003, the effectiveness of Extension's efforts to design and populate the Extension web site. As a result of the audit, responsibility for designing the look and navigation of the web site, for marketing Extension and its educational programs, and for distributing

information was moved from information technology to communications and marketing in July 2004.

In November 2003, the associate director of Agriculture and Natural Resources, the state leaders for Family Consumer Sciences and 4-H and Youth Development, specialists, and county agents met to provide input for the purpose of developing a campaign to heighten awareness of Extension within central Arkansas and to more efficiently use Communications and Marketing to enhance the dissemination of research-based information and knowledge and to support efforts to engage Arkansans.

Overview

Using the power of mass media, to include the Internet, the Cooperative Extension Service quickly disseminates research-based and timely information to Arkansans throughout the state. The communications and marketing section has established and maintains a comprehensive system for distribution of information in the format requested by individual representatives of the broadcast media in all markets within Arkansas. The Extension Service places stories with the broadcast media and coordinates efforts to make specialists and county agents available for interview on topics and issues relevant to Arkansans.

The University of Arkansas Cooperative Extension Service worked with commercial television and radio stations in the Little Rock region and partnered with KUAR/KLRE public radio based on the campus of the University of Arkansas at Little Rock and the University of Central Arkansas-based Arkansas Educational Telecommunications Network, which broadcasts statewide, in scheduling content specialists to provide information to thousands of households throughout the year. Communications and Marketing also works with and provides information through statewide commercial radio, cable and television broadcast stations. Topics selected reflect the curriculum and content provided through Extension programs conducted statewide and draw upon the expertise of content specialists, providing timely information. Samples of topics discussed and public service announcements and video news releases produced and broadcast are listed.

- Horticulture
- Row Crop Production
- Market Trends
- Beef Production
- Environmental Practices
- Public Policy Issues
- Rural Community Development
- Recycling
- Family Life Issues
- Food Safety and Nutrition

- Child Care Providers
- Parenting Practices
- Public Issues
- 4-H and Youth Development
- Financial Planning

Extension Program Results and Accomplishments

Output Indicators

- 115 Radio news releases written and distributed to statewide radio outlets, dealing with timely topics in agriculture, family and consumer sciences, 4-H and youth development, community development and public policy issues.
- 53 Appearances by content specialists on statewide commercial television.
- 68 Radio scripts written by content specialists, edited by the director of communications and marketing and posted on the intranet for county faculty statewide to download and use on local radio stations and cable networks and as weekly newspaper columns.
- 96 Radio public service announcements produced and aired on KUAR/KLRE public radio affiliates housed at the University of Arkansas at Little Rock. Topics included information on healthy weight, nutrition, financial management, public policy issues, personal and family health, youth development, pet and animal care, horticulture and agriculture.
- 10 Today's Garden, a series of 30-minute programs about horticulture and gardening aimed at people who are involved in gardening, was produced and delivered to the Arkansas Educational Telecommunications Network where it was broadcast statewide three times each month.
- 6 Appearances by county faculty as guests demonstrating practices in nutrition on "Fighting Fat," a program produced and broadcast each month by the Arkansas Educational Telecommunications Network.

Outcome Indicators

- 700,000 Households per commercial television station in the Little Rock region that watch the evening news when public service announcements and/or video news releases are played.
- 300,000 Households that watch morning news programs per station in the Little Rock region when specialists and county agents appear as guests or video news and/or public service announcements are played.
- 163 Commercial radio stations located statewide in Arkansas, which are sent radio produced announcements for airing and some of which air programs produced by county faculty using prepared scripts.

- 16 Non-commercial radio stations located statewide in Arkansas, which are sent radio produced announcements for airing, and some of which air programs produced by county faculty using prepared scripts.
- 18 Commercial television stations sent public service announcements and video news releases for distribution via airwaves.

Source of Funds

Federal, state and grant funds.

Scope of Impact

Dissemination – Statewide via broadcast media; nationally via RadioSource web site.

Scope of Program – Anyone with a radio or television and who resides within defined broadcast zones for each radio or television station has access to the information.

Program Response: Print Media Programs

Contact: Bob Reynolds, Director of Communications and Marketing, 501-671-2128, breynolds@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service offers a host of educational programs and information to Arkansans. The traditional method of delivery is through the county or state faculty in one-on-one or small group workshops and classes. By using the print media, Extension expands its outreach to targeted clientele in agriculture, community development, family and consumer sciences, 4-H and youth development and public policy issues.

Stakeholder Input

Newspaper editors are surveyed to determine interest in content and article length for the following year. Content specialists and county faculty provide input as well, and article content is determined based upon current events and issues that impact Arkansans. A clipping service provides weekly input as to the use of news articles.

Overview

The University of Arkansas Cooperative Extension Service produces and delivers a weekly media package and timely spot news stories to all weekly and daily newspapers in Arkansas and to numerous magazines. Extension delivers its feature package and spot news stories to each newspaper in a format requested by the newspaper.

News articles and spot news stories are posted each week on the Arkansas Press Association's electronic bulletin board and on the Extension Service's web site under News.

In addition, the feature articles and spot news stories are distributed via e-mail or by mail, depending upon the specific needs of each news outlet. Photographs are posted electronically with the news stories for downloading by news outlets. Articles cover current issues in agriculture, family and consumer sciences, community development, 4-H and youth development and public policy issues.

Extension Program Results and Accomplishments

Output Indicators

- 50 News packages written, edited and distributed statewide to all weekly and daily newspapers in Arkansas and to various magazines. Each feature package contains approximately five to six news articles each week, for a yearly total of 300 news stories during the year that provide readers with information such as the abatement of fire ants, West Nile Virus, beef production, row-crop production, money management, nutrition, child care and youth development.
- 78 Number of spot news stories that were distributed statewide for use by weekly and daily newspapers.
- 405 Number of direct media contacts during 2003 to generate interest in garnering news coverage in print and non-print on issues related to agriculture, family and consumer science, public policy issues and 4-H and youth development.
- 150 Number of news stories successfully pitched to large daily newspapers with wide readership.

Outcome Indicators

- \$380,000 Total market value of editorial coverage about the University of Arkansas Cooperative Extension Service in central Arkansas media.
- 636,000 Number of households in Arkansas subscribing to daily newspapers in Arkansas; the articles distributed to the daily newspapers are accessible by these households.

- 298,415 Number of households in Arkansas subscribing to weekly newspapers in Arkansas; the articles distributed to weekly newspapers are accessible to these households.
- 12,500 Number of newspaper clips, which indicates the number of times articles appear in print in the weekly and daily newspapers.

Source of Funds

Federal, state and grant funds.

Scope of Impact

Dissemination – News features and news articles about issues and programs important to Arkansans are available statewide through the newspapers and internationally through the Extension web site.

Scope of Program – Readers use the news articles to make decisions regarding agriculture production, family and consumer sciences, community development and 4-H and youth development. In addition, many readers participate in Extension programs after reading about their availability.

Program Response: Support Material

Contact: Bob Reynolds, Director of Communications and Marketing, 501-671-2128, breynolds@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service enhances its educational program at the county level by providing up-to-date and research-based fact sheets in agriculture, family and consumer sciences, 4-H and youth development, community development and public policy issues.

Stakeholder Input

County Extension agents have requested a ready and consistent supply of fact sheets delivered quickly upon request.

Overview

The University of Arkansas Cooperative Extension Service has been transferring fact sheet titles from printed versions, which reside in the warehouse, to electronic versions that are printed upon demand only on request from county Extension offices and from content specialists. Electronic versions of the fact sheets are posted on Extension's web site as well, allowing immediate access to clientele who have access to the Internet. The content of some fact sheets becomes the core of news releases to further disseminate information.

- 40 Number of new fact sheets written, designed, made available for print-on-demand and placed on the Web for public access.
- 37 Number of fact sheets revised, updated, designed, made available for print-on-demand and placed on the Web for public access.

Titles of fact sheets include:

A sample of titles of fact sheets includes:

- Developing Beef Bulls
- Livestock Health Series: Calf Scours, Anaplasmosis, Grass Tetany, Johne's Disease, etc.
- Powdery Mildew of Landscape Ornamentals
- Leaf Spot of Redtip Photinia
- Garden Phlox
- Tree Fruit Nursery Sources
- Houseplant Problems and Solutions
- Culling the Beef Cow Herd
- Aflatoxin M1 in Milk
- Using Natural Regeneration to Promote Oaks in Upland Hardwood Stands
- Marketing Meat Goats

When fact sheets are made available for print on demand, county Extension agents are provided a copy and notification to increase awareness of availability for county residents.

Extension Program Results and Accomplishments

Output Indicators

- 77 New and revised fact sheets designed and made available for print-on-demand and for web access.

- 15 Miscellaneous publications designed for a combination of publication by offset press, Web and print-on-demand. Included are the MPs that are frequently used by county faculty and agriculture producers relative to pesticide and chemical applications.
- 75 Issues of Extension newsletters directed at targeted clientele. Titles include Extension News (web only), Extension Cord, Dairy Digest, Arkansas ReLeaf, Beef Cattle Research Update, Beef Champs, Vision 2010, Best Care, Farm Management, Tunnel Vision.
- 14 Brochures supporting the promotion and recruitment of clientele for Extension's educational programs to include workshops and agriculture field days held throughout the state. Titles include: Arkansas Green Industry, Best Care, Legacy, Arkansas Grown, Estate Planning and RESQ.
- 16 Program guides used by county faculty in conducting workshops and information for clientele in meeting locally driven educational programs and needs (includes State 4-H O-Rama programs).
- 54 Weekly news reports that provide timely and dynamic information to producers who subscribe to this service. Major report: Rice Market News.
- 2,325 Signs and displays that are used by county agents and specialists during events and workshops.
- 348,106 The quantity of fact sheets printed and distributed to county Extension offices through print-on-demand services for distribution to clientele and for use in workshops provided for clientele at the county level.

Outcome Indicators

- 75 Every county Extension office has ordered and taken advantage of print-on-demand, allowing quick access to current, updated and research-based information for walk-in clientele and clientele attending workshops provided by county faculty.

Source of Funds

Federal, state and various grants.

Scope of Impact

Dissemination – Statewide at the county level.

Scope of Program – Statewide at the county level.

KEY THEME: INFORMATION TECHNOLOGIES
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**Program Response:
Agriculture Decision Tools**

Contact: Nina R. Boston, Director of Information Technology, Department of
Information Technology
(501) 671-2135, nboston@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service enhances the delivery of its educational programs by creating software decision tools that help clientele interpret and manage their information.

Stakeholder Input

Extension specialists and agents who have worked directly with the research and have received requests from agricultural clientele communicate the needs to the Department of Information Technology.

Overview

The University of Arkansas Cooperative Extension Service maintains computer software that translates research-based data into focused recommendations or assists clientele in managing information critical to their business operations. Some of the most popular programs include:

- DD50 Rice Web predicts critical events during the season based upon variety and temperature data.
- Irrigation Scheduling uses temperature, rainfall and past irrigation data to predict timing and amount of irrigation.
- Cotton Pheromone Trap Reporting compiles reports from insect traps in Arkansas and other states to analyze/graph the degree of infestation.
- Farm Management organizes soil, water and manure testing, fertilizer and pesticide applications and budget data for producers.
- Soybean and Rice Variety Selections recommends the appropriate varieties to plant based upon location, plant date, soil type and disease resistance.
- Rice Seeding Rates calculates volume of seed needed based upon variety, location, planting date, soil type, seeding method, drill width and seedbed preparation.

These and other programs can be found at <http://aragriculture.org/computer/default.asp>.

The software decision tools are delivered to clientele, in coordination with county Extension offices, to run on home/office computers or through interactive web pages.

Extension Program Results and Accomplishments

Output Indicators

The web-based software products delivered are developed using Microsoft InterDev and run on a Microsoft NT server running Internet Information Server, supported by a Microsoft Visual FoxPro database structure. Standalone products are primarily developed using Microsoft Visual FoxPro.

- 402 Standalone decision tools delivered.
- 40 Counties in Arkansas with clientele requesting copies of decision tools.
- 24 States requesting copies of tools.
- 12 Foreign entities requesting decision tools (Africa, Algeria, Brazil, Egypt, Hungary, India, Indonesia, Israel, Malaysia, Portugal, Thailand and Turkey).
- 673,424 Acres enrolled in the web-based DD50 Rice Web decision tool by 1,552 producers.

Outcome Indicator

Producers across the state of Arkansas use the research-based decision tools to manage the selection of variety, determine seeding rates, manage critical event dates, analyze irrigation needs, and organize soil, water, manure, and forage testing results. The impact of these tools is a better informed clientele base, a more efficient handling of resources and time. Producers using the Farm Management decision tool accumulate the necessary data required by the Environmental Protection Agency and the Arkansas Department of Environmental Quality (ADEQ). The report output from the program has been endorsed as an accepted format for submission to ADEQ.

Source of Funds

State operating funds, Smith Lever, grant from Rice Promotion Board, Soybean Improvement grant, and Integrated Pest Management funds.

Scope of Impact

Dissemination – The decision tools are used statewide and have been shared internationally.

Scope of Program – The decision tools are state specific to Arkansas, but can be exported with modifications.

Program Response:

<http://www.uaex.edu>

Contact: Nina R. Boston, Director of Information Technology, Department of Information Technology
(501) 671-2135, nboston@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service reaches out to every Arkansas community with educational programs designed to improve the quality of life. Technology plays an increasingly important role in delivering our educational information quickly and efficiently. Web-based technology has been employed to extend our reach to Arkansans who have not traditionally participated in Extension programs.

Stakeholder Input

Teams representing different consumer interests review and make recommendations regarding the content and organization of material placed on the web. Input is received from Extension specialists, agents, administrators, support staff and clientele.

Overview

The University of Arkansas Cooperative Extension Service web site, <http://www.uaex.edu>, continues to deliver research-based education to Arkansas and beyond. Teams of Extension specialists, counties and support staff manage the content of the different areas of focus:

- Arkansas Agriculture, <http://www.aragriculture.org>
- Arkansas Families, <http://www.arfamilies.org>
- Arkansas Communities and Businesses, <http://www.arcommunities.org>
- Arkansas Home and Garden, <http://www.arhomeandgarden.org>
- Arkansas Natural, <http://www.arnatural.org>
- Arkansas Youth, <http://www.kidsarus.org>

Two web developers mark up the content to conform to existing standard and both state and federal accessibility regulations.

Extension Program Results and Accomplishments

Output Indicators

Web pages are designed in Microsoft FrontPage. All pages contain requisite menus, toolbars and branding to present a consistent look and feel. In 2004, content was converted to cascading style sheets to improve change management and visual presentation. Federal and state regulations are followed to meet accessibility guidelines.

Outcome Indicators

- More than 8,000,000 visits (hits) accessed information concerning publications, jobs, hot topics, newsletters, county office and other miscellaneous areas.

- More than 1.2 million visits (hits) accessed information concerning agriculture. Agricultural news and commercial horticulture received the most attention.
- More than 865,000 visits (hits) accessed information on homes and gardens. The popular Plant of the Week and Landscape sections were the most visited.
- Over 395,000 visitors (hits) accessed information on families. Family life and money sections were popular.
- More than 281,000 visits (hits) accessed information on communities and businesses. Information provided Arkansans on volunteerism garnered most interest.
- Almost 337,000 visits (hits) accessed information on youth with the 4-H GoForIt section garnering 41 per cent of the visits.
- Approximately 121,000 visits (hits) accessed information on the environment. EQUIP, recycling and wildlife were popular topics.

Source of Funds

State operating funds and Smith-Lever.

Scope of Impact

Dissemination – The Arkansas Extension web site is accessed worldwide.

Scope of Program – The web site is state specific. Arkansans with Internet access find and take advantage of the educational wealth offered to them on the web site. However, the information is available worldwide.

Program Response:

AIMS

Contact: Nina R. Boston, Director of Information Technology, Department of Information Technology
(501) 671-2135, nboston@uaex.edu

Situation

The University of Arkansas Cooperative Extension Service is regularly required to produce reports to federal, state, and county entities concerning the educational programs being delivered and, more importantly, the impact of those programs. Disparate methods of gathering the information for such reports resulted in duplication of efforts and loss of

vital data. A centralized system to tie plan of work to program delivery and then to impact reporting was needed to more efficiently manage the information of Extension.

Stakeholder Input

Input was garnered from the following stakeholders:

- Associate Vice President for Agriculture – Extension
- Associate Directors for ANR, FCS and 4-H
- District Directors
- Extension Specialists
- County Extension Agents
- Extension Evaluation Specialist
- Director of Information Technology
- Extension Computer Specialist

Overview

Evaluation of the situation resulted in three findings:

1. Extension subject matter specialists and agents needed a tool that would allow them to enter plans of work and tie them to event schedules, program delivery and impact reporting.
2. Dynamic report generation was vital to meeting the frequent reporting demands throughout the year.
3. Civil rights reporting and performance evaluation reports must be incorporated with the subject matter reporting.

Although employees are located in offices throughout the state, central management of the information was critical. The aging inventory of computer equipment in county offices also had to be taken into account, as well as the varying technology skill levels of Extension employees.

The solution was a web-based management system, accessible to all Extension employees. The Arkansas Information Management System [AIMS] uses a simplified menu system to aid faculty in stepping through the different constructs of the system.

When a faculty member submits a plan of work, an e-mail notification is automatically sent to the appropriate supervisor, who will review and approve the plan. As a faculty member sets up a program event, an appointment for that event is automatically sent from the program to the individual's GroupWise calendar. Impact data must be entered by the fifth day of each month. Reports can be generated on-demand at any time from any Internet-ready desktop.

Extension Program Results and Accomplishments

Output Indicators

The software product delivered was developed using Microsoft InterDev and runs on a Microsoft NT server running Internet Information Server. It is web-based, menu driven, supported by a Microsoft Visual FoxPro database structure.

- 24 Extension base programs from which faculty may choose for plans of work. The offerings include
- 9 Extension Focus programs of heightened interest from which faculty may choose. The offerings include.
- 30 Individual programs created on-the-fly by faculty to capture program data that does not fit under the Extension and Focus program definitions.

Outcome Indicator

The primary impact of this program is increased data integrity in reporting.

As a result of the program, Arkansas Extension faculty have only one place to go to plan and report program information.

Source of Funds

State operating funds and Smith-Lever.

Scope of Impact

Dissemination – 100 percent of Extension faculty have access to the program.

Scope of Program – This program is state specific to Arkansas, but can be exported to other states with minor modifications.

Program Review

Stakeholder Input

Arkansas Extension has operational, county-specific advisory councils for each of our 75 counties. Each County Council is comprised of local elected officials and stakeholders representing agriculture, youth, family, and consumer science interests. Each county council annually evaluates the results of Extension programs through formal program reviews, and provides input into program planning for the next fiscal year. Formal presentations of program results are made by Extension faculty to guide this process. This focused evaluation and planning process is conducted from June-August of each year.

State specialists serve on advisory committees and work regularly with diverse stakeholder groups, including Farm Bureau, commodity promotion boards, state agency and regulatory groups, and program specific advisory groups to assist in the evaluation of current efforts and to provide feedback related to changing needs. Specialists likewise meet with county faculty, district administrators, and experiment station scientists to facilitate linkages between local needs and research priorities.

One of the most essential parts of the 2003-2004 Division of Agriculture strategic planning process was to listen to what people in Arkansas felt were important issues and priorities for the Division to address. Input into the planning process was given by both external and internal stakeholders through a variety of processes. Efforts were taken to identify and receive input from individuals representing diversity of perspectives, races and genders. External stakeholders included representatives of statewide organizations and agencies, legislators and local officials, agribusinesses, agricultural producers, homemakers, educators, health professionals, community leaders, elected officials, and members of program advisory groups. Internal stakeholders included faculty and staff working for the Cooperative Extension Service and the Agricultural Experiment Station.

Feedback from External stakeholders was collected through a series of sixteen stakeholder meetings held throughout the state. At these meetings, participants were asked to identify major issues and trends that they felt would impact Arkansas and on which of those issues they thought the Division of Agriculture should concentrate its efforts over the next five years. A total of 503 Arkansans participated in these sessions.

Division faculty and staff were also provided opportunities for input into the planning process through two Web-based on-line surveys, one conducted through the University of Arkansas-Fayetteville Website and the other through the Cooperative Extension Service's intranet Website. These surveys asked respondents to describe what they thought the Division of Agriculture units should be like in five years, what was needed to achieve that vision, what trends they felt would impact the Division, and what priorities should direct Division programs over the next five years. A total of 148 Division faculty and staff responded to the surveys.

Responses from stakeholders were summarized and provided to five strategic planning writing teams. Input from stakeholders was utilized by the writing teams

in the identification of priority issues and the development of strategies to address those issues. The report of these finding will be produced this year for support of the Division Plan of Work.

Program Review Process

An updated 5-Year Plan of Work was submitted in 2003-2004.

Evaluation of Success of Multi and Joint Activities

Extension Planned Programs have been evaluated for the past two years through a process related to the identification of cross-discipline Focus Programs. Each Focus Program is guided by a multi-disciplinary committee that formally reviews needs, outcomes, and impacts and facilitates statewide planning support for multiple program efforts within each Focus Program. Focus Program committees are comprised of both Extension and split-appointment AES/UAF faculty to link research and extension practice. A description of Extension program specific need identification, stakeholder input, outputs, outcomes and evaluation results for 2003-2004 are included in the individual Extension program narratives reported by federal goal and key themes.

To assist in the evaluation of planned programs a web-based planning, reporting and evaluation system, the Arkansas Information Management System (AIMS), was developed to generate a searchable database that could examine outputs, outcomes and impacts as well as populations served. AIMS data for 2003-2004 allows Extension to evaluate “all reasonable efforts” by program, county, district and/or statewide. Arkansas Extension efforts are audited annually, on a county specific basis, to assure that minority populations are served. As a result of this database tool, Efficiency and effectiveness data can now be produced through the combination of financial and outcome data. AIMS provides “real-time” data access to support these evaluation efforts.

Based on AIMS evaluation data for 2003-2004, Arkansas CES documented:

Total number of educational contacts – 2,178,920

Efficiency

Total cost per educational contact - \$17.44

Educational contacts per professional FTE – 3,481.98

Effectiveness

Total new practices adopted – 412,447

Diversity

Total educational contacts by gender	
Female	854,280
Male	1,324,640
Total educational contacts by age	

Adult	1,704,510
5-8 years	132,670
9-13 years	207,380
14-19 years	341,740
Total Youth	681,790
Total educational contacts by race	
White	1,645,305
Black	294,275
Asian	6,564
Hispanic	48,834
Indian	6,649
Other	177,292

Integrated Research and Extension

Research and Extension programming is integrated through multiple mechanisms, including split-appointments, joint departmental and program administration, applied research teams, program planning, Focus Program management, and joint committee and task force membership. All Arkansas Extension (CES) sections worked with Arkansas Experiment Station (AES) faculty in 2003-2004 to increase affiliation and partnership linkages, to insure a comprehensive integration of efforts.

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

Institution University of Arkansas Cooperative Extension Service
State ARKANSAS

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

Actual Expenditures

Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Southern Region Extension Forester/Master Tree Farmer	6,223	25,415	44,773	51,736.56	55,441.60
Pesticide Applicator Training	3,688	130,201	112,328	37,220.40	41,195.20
Southern Region ANR Committee	12,539	9,375	7,988	3,556.00	3,052.80
Southern Region Sustainable Agriculture Program	5,532	243,737	292,052	93,672.80	142,624.00
Southern Region 4-H Horse Show	3,688	5,833	6,989	2,540.00	6,443.52
KOMA Beef Cattle Conference	2,213	9,583	13,979		4,126.08
AR-MO Dairy Conference	4,057	0	0	1778.00	-0-
AR-MO-OK Dairy Tour		8,750	9,985		1,375.36
Southern Dairy Conference	1,106	1,667	1,997	1,603.84	1,017.60
Mid South Dairy Show	2,950	5,833	3,495		1,375.36
DHIA		33,332	39,939	8,354.80	6,387.84
National 4-H Dairy Conference	2,213	4,166	998	254.00	254.40

SERA-IEG for Dairy		833	998	508.00	508.80
Four-State Heartland Community Development Conf.	2,397	4,583	3,994	4,182.00	508.80
Tri-State Soybean Forum	13,276	19,582	18,971	5,588.00	9,241.92
Southern Region Conservation Tillage Conference	1,475	8,333	1,4981	3,702.76	-0-

Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Southern Region Soil Fertility Conference	1,475	2,500	1,997	1,016.00	-0-
Money & You - Limited Resource Financial Management Pro.	16,596	63,747	42,435	5,279.60	-0-
National 4-H Congress	9,220	9,166	17,473	5,279.60	4,710.40
National 4-H Conference	2,950	5,000	5,492	3,702.76	3,778.24
Southern Region 4-H Volunteer Leader Forum	4,425	14,999	7,988	2,886.56	3,871.68
Southern Region Accountability Workshop	13,277		25,461		-0-
Mid South Fair 4-H Day	6,638	21,249	25,461		7,337.92
Kansas City 4-□ Global Conference	6,270	8,333	9,985	3,715.68	4,277.12
National and Southern Region 4-H Program Leaders Comm.	2,582	3,541	4,243	1,270.00	1,780.80
National/Southern Region FCS Program Leaders Committee	3,688	6,041	3,994	2,032.00	1,526.40
Money 2000	36,879	62,497	110,830		-0-
4-H Cooperative Curriculum System	7,007	17,082	19,470	9,116.80	10,430.40
Experiential Learning Design Team	3,688	2,917	3,495		-0-
Southern Region Program Leadership Committee		2,708	0	7,620.00	11,448.00
Arkansas Risk Management Education Initiative		11,666	4,992		-0-
Southern Region Watershed Resources Management		281,235	349,463	108,904.00	103,152.00
Lower Mississippi Valley Initiative		23,332	7,489		508.80
Southern Region Fire Ant Management		304,984	499,233	200,480.00	154,580.80
MS/LA/AR 4-H Workforce Preparation			998	6,096.00	15,347.52

SERA-IEG 6 Soil/Plant/Byproduct/Water Analysis			1,498		-0-
Preventing Foodborne Illness in a Vulnerable Population in the Lower Mississippi Delta			1,997	2,540.00	5,360.32
Southern Region Middle Managers Conference			7,489	9,144.00	2,28930
4-H Volunteer Core Competencies				6,604.00	3,561.60

Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
Southern Region Cooperative Extension Curriculum Committee				1,524.00	-0-
Interactive Web-Based Risk Management Training for Mid-South Producers				9,144.00	1,272.00
National Grassland Contest					15,542.40
HorseQuest Information				6,096.00	1,017.60
Delta HOPE (Healthy Options for People Through Extension Master Farmer)				3,810.00	23,746.88
Master Farmer				46,446.00	61,513.60
National Network of Forest Practitioners				2,032.00	3,052.80
Urban Forestry Council				7,230.00	3,919.36
National Web-Based Learning Center for Non-Federal Forest and Rangelands				7,552.88	18,316.80
NatureMapping				16,012.96	15,037.44
9 th Annual Conference of the Wildlife Society				1,778.00	1,780.80
10 th National Fisheries & Wildlife Extension Specialists Conference				1,524.00	1,526.40
10 th Wildlife Damage Management Conference				6,723.76	7,960.00
TOTAL	\$176,052	\$1,352,220	\$1,686,006	\$702,148.88	\$988,851.46

March 29, 2005
Form CSREES-REPT (2/00))

Dr. Milo Shult
Director

Date

ATTACHMENT TO APPENDIX C

MULTI-STATE EXTENSION ACTIVITIES

Program Statements

Southern Region Extension Forester/Master Tree Farmer

Arkansas continues to participate with the other southern region states to support the regional forester. Arkansas has also participated in planning and facilitating the Master Tree Farmer satellite short course series since 2000. Last year four counties hosted the seven-week short course. The forestry specialist was part of the broadcast that reached over 2,000 private forest landowners across the southern region.

Funding: \$55,441.60

FTEs: .9 FTEs

Pesticide Applicator Training

Arkansas participates with Mississippi and Louisiana in the development of pesticide educational materials for the three states. These include study materials for the non-agricultural, as well as agricultural, pesticide applicator categories. Study guides for the non-agricultural categories (i.e., structural pest control, turf and ornamental, etc.) were revised in FY04. The study guides were revised using information and publications provided by other states.

Funding: \$41,195.20

FTEs: .69 FTEs

Southern Region ANR Committee

The ANR state leader continues to be an active participant in planning southern region Extension ANR committee activities.

Funding: \$3,052.80

FTEs: .05 FTEs

Sustainable Agriculture for the Southern Region

The Southern Region SARE program is conducted as a comprehensive program incorporated into many of the Extension programs within Arkansas. Some efforts include the SARE Program Resources/Grant Funding Opportunities Training for county agents statewide, training for Small Farm Managers in Vegetable Production and Marketing, and training on Farm Support Program Availability and Access for county agents, small farm program specialists, farmers, and community leaders in south and central Arkansas.

Funding: \$142,624.00

FTEs: 2.38 FTEs

Southern Regional 4-H Horse Show

Arkansas is one of 13 states in the southern region that is an active participant and planner of this activity. The team of specialists involved with the Southern Regional Horse Show met in August 2003 to plan future show dates, add activities, revise activities, and submit budgets through 2004. The 2004 Southern Regional Horse Show was conducted July 28 - August 1 in West Monroe, Louisiana. The Louisiana Cooperative Extension Service and the Arkansas Cooperative Extension Service served as the co-hosts for the event.

Funding: \$6,443.52
FTEs: .11 FTEs

KOMA Beef Cattle Conference

Kansas, Oklahoma, Missouri and Arkansas plan and conduct this successful program biennially. It is Arkansas' turn to host the 2005 KOMA conference. The conference is scheduled for February 24, 2005 in Dardanelle, Arkansas. The 2005 conference will address Stocker Cattle Management.

Funding: \$4,126.08
FTEs: .07 FTEs

AR-MO-OK Dairy Tour

Arkansas, Missouri, and Oklahoma Extension specialists and county agents plan and conduct tours annually for farmers and others. This continues to be a successful program to stretch limited resources by demonstrating technology to the dairymen of the region.

Funding: \$1,375.36
FTEs: .02 FTEs

Southern Dairy Conference

Southern Region Dairy Conference continues to be an active educational activity, primarily for dairy marketing, which involves Extension dairy production specialists, economists, milk marketing cooperatives, and milk manufacturing personnel from the southern region.

Funding: \$1,017.60
FTEs: .02 FTEs

Mid South Dairy Show

This continues to be an excellent opportunity for farmers and youth to view results of cattle breeding. States involved are Arkansas, Missouri, Texas, Louisiana, Mississippi, Tennessee, Kentucky, Illinois, and Indiana.

Funding: \$1,375.36
FTEs: .02 FTEs

DHIA (Dairy Herd Improvement Association)

Dairy Herd Improvement Association (DHIA) utilizes production testing and record management to improve the efficiency of milk production. Multi-state activities with Heart of America DHIA, Manhattan, Kansas, and Dairy Records Management Systems (DRMS), Raleigh, North Carolina, include primarily training activities for specialists and DHIA personnel.

Funding: \$6,387.84
FTEs: .1 FTEs

National 4-H Dairy Conference

Arkansas continues to support specialists and a team of 4-H youth to participate.

Funding: \$254.40
FTEs: .00 FTEs

SERA-IEG for Dairy

This continues to provide for the exchange of information among dairy Extension and related specialists usually working in conjunction with the planning of the

Southern Dairy Conference.

Funding: \$508.80
FTEs: .01 FTEs

Four-State Heartland Community Development Conference

The last conference organized by this group was in 2001. Currently this is an information exchange group of Extension specialists and community development professionals in the four-state region (Arkansas, Kansas, Missouri, and Oklahoma). Two roundtable discussions were held during this past fiscal year, in Neosho, Missouri, and Big Cabin, Oklahoma.

Funding: \$508.80
FTEs: .01 FTEs

Tri-State Soybean Forum

The Tri-State Forum is held each year and provides soybean producers, ag industry and Cooperative Extension Service personnel the opportunity to learn about current soybean production and marketing practices being conducted in soybean producing areas of the Delta. This meeting is usually held on the first Friday of January and rotates between Arkansas, Mississippi, and Louisiana. Extension soybean specialists, county Extension agents, soybean producers, and ag industry representatives are responsible for planning the program, and it is developed through quarterly meetings.

Funding: \$9,241.92
FTEs: .15 FTEs

Southern Region Plant Nutrient Management Conference

Soil scientists, agronomists, environmental specialists, crop consultants, private labs, and other interested parties meet to exchange information on soil fertility, plant nutrition trends and new technology and research to improve fertilizer use efficiency. The meeting is normally held during the month of October in Olive Branch, Mississippi. More than 50 participants heard 6 invited speakers and Extension specialists from 13 southern states sharing their experiences on micronutrient research.

Funding: \$5,088.00
FTEs: .08 FTEs

National 4-H Congress

National 4-H Congress provides youth with the opportunity to increase their knowledge, acquire leadership skills, interact with youth from across the nation, and participate in cultural events. The national event involved youth from 48 states and 2 territories. Forty-two youth and five adults attended the event held in Atlanta, Georgia.

Funding: \$4,710.40
FTEs: .08 FTEs

National 4-H Conference

Five Arkansas youth delegates and one Extension faculty member participated in National Congress held at the National 4-H Center.

Funding: \$3,778.24
FTEs: .06 FTEs

Southern Region 4-H Volunteer Leader Forum

Thirteen volunteer leaders and two Extension faculty participate in this three-day training for 4-H volunteer leaders in Rock Eagle, Georgia.

Funding: \$3,871.68
FTEs: .07 FTEs

Mid South Fair 4-H Day

Arkansas, Tennessee, Missouri, and Mississippi continue to provide leadership to 4-H Day activities at the Mid-South Fair held in Memphis, Tennessee. Youth from all states participate in educational and competitive events in family and consumer sciences and agriculture and natural resources.

Funding: \$7,337.92
FTEs: .13 FTEs

Kansas City 4-H Global Conference

Arkansas, Missouri, Kansas, Iowa, and Nebraska continue to provide leadership to the 4-H Global Conference held in Kansas City. Youth delegates participate in educational and competitive events, interact with youth from other states and participate in leadership activities.

Funding: \$4,277.12
FTEs: .07 FTEs

4-H Volunteer Core Competencies

A Design Team of Arkansas Extension agents and specialists was put together to see about adapting the Oklahoma 4-H Core Competency Training Curriculum. The team attended training in Oklahoma, then reviewed and adapted Oklahoma's training materials. The resulting curriculum (Unit 1 – *This is 4-H* and Unit 2 – *Getting the Most Out of the 4-H Experience*) is now in use for training in Arkansas.

Funding: \$3,561.60
FTEs: .05 FTEs

National and Southern Region 4-H Program Leaders Committee

State 4-H program leaders meet for a three-day national and a three-day southern region program planning session on an annual basis. Quarterly phone conferences are held to maintain communication and coordinate joint activities.

Funding: \$1,780.80
FTEs: .03 FTEs

National and Southern Region FCS Program Leaders Committee

State FCS program leaders meet for a three-day national and a three-day southern region program planning session on an annual basis. Quarterly phone conferences are held to maintain communication and coordinate joint activities.

Funding: \$1,526.40
FTEs: .02 FTEs

4-H Cooperative Curriculum System

The National 4-H CCS develops, reviews, evaluates, and distributes research-based, peer-reviewed curriculum for youth. Arkansas participates as jury members and committee members in developing, piloting, and reviewing curriculum. In addition, during FY04 Arkansas had one faculty member serving on the National Curriculum

Committee Board of Directors and one faculty member serving on a Design Team.

Funding: \$10,430.40
FTEs: .16 FTEs

Southern Region Program Leadership Committee

The Southern Region Program Leadership Committee has responsibility for planning the annual three-day conference. The committee also reviews and approves action and information items from the seven individual committees before they are sent to the Directors for approval or consideration. Nine Extension specialists participated in the meeting held in August, 2004, in Biloxi, Mississippi.

Funding: \$11,448.00
FTEs: .17 FTEs

Interactive, Web-Based Risk Management Training for Mid-South Producers

The purpose of this multi-state effort is to improve the risk management skills of mid-south producers and lenders through seminars and/or workshops and the development of printed and web-based educational materials. This educational effort will take advantage of the latest technology to deliver timely, relevant, and useful information to producers and other agricultural professionals. Participating states include Mississippi, Louisiana, Tennessee, and Kentucky.

Funding: \$1,272.00
FTEs: .02 FTEs

Southern Region Watershed Resources Management

The Southern Region Extension Watershed Resources working group consists of the 13 states in EPA Regions 4 and 6. The purpose of this group is to facilitate regional coordination among the Land Grant Universities to combine and foster more efficient use of our resources. This work group is currently funded through the CSREES' 406 Regional Facilitation Grant Program. This work group works closely with partners such as EPA to address water quality issues. In fact, by combining resources the group has been able to fund an EPA liaison position for both Region 4 and 6. Each state has an appointed water quality coordinator. These coordinators work together to develop and implement regional plans such as a bi-annual Water Quality Conference, joint county agent training workshops, and information sharing through a regional web site.

Funding: \$103,152.00
FTEs: 1.73 FTEs

Lower Mississippi Valley Initiative

The Lower Mississippi Valley Initiative is a coordinated effort to create an agriculturally based water quality educational program in Arkansas, Louisiana, Mississippi, Texas, Oklahoma, Tennessee, and Kentucky. Master Farmer is an outgrowth of Lower Mississippi Valley Initiative.

Funding: \$508.80
FTEs: .01 FTEs

Southern Region Fire Ant Management

The Southern Region has a Fire Ant Management program that includes an annual conference, multi-state publications and sharing of educational materials. Much of the educational materials being used have been developed and shared by the Arkansas

Cooperative Extension Service and other southern regional state Extension programs. Arkansas is also involved in a collaborative effort with the USDA-ARS and USDA-PPQ in the release of two biological control organisms – *Pseudacteon tricuspis* and *Thelohania solenopsae*.

Funding: \$154,580.80
FTEs: 2.57 FTEs

4-H Workforce Preparation

Tri-state (Mississippi, Louisiana, and Arkansas) collaborative effort initiated to develop a workforce preparation pilot program targeting the Delta. Four 4-H faculty members and four youth participated in a design team planning conference in FY04, and six county faculty members and 41 4-H youth participated in the 4-H Tri-State Workforce Conference held in Arkansas August 2004.

Funding: \$15,347.52
FTEs: .24 FTEs

Preventing Foodborne Illness in a Vulnerable Population in the Lower Mississippi Delta

The overall goal of this program was to develop a strategy for preventing foodborne illness and improving nutrition for families living in the lower Mississippi Delta who utilize services of food recovery programs. Food recovery operations in Mississippi, Louisiana, and Arkansas have been identified and were evaluated to determine current food handling and storage practices. A curriculum to address safe practices was developed and taught through a train-the-trainer approach. During FY03, a statewide training was conducted with Family and Consumer Sciences agents and food service workers. To date nearly 200 participants have been trained to use the curriculum and the project funding ended September 2004.

Funding: \$5,360.32
FTEs: .09 FTEs

Southern Region Middle Managers Conference

The conference is held every other year in one of the 13 southern region states. Its focus is management training for mid-level managers on a variety of topics including programming, supervision and evaluation of employees.

Funding: \$2,289.60
FTEs: .03 FTEs

National Grassland Contest

The goal of the grassland evaluation program is to teach decision-making skills to 4-H and other youth in grassland resource management. This contest integrates the subjects of pastures, livestock, soils, wildlife and plant identification to teach students an overall awareness of proper grassland management. The program is based on a classroom curriculum that can be taught in four sections – Grassland Condition, Wildlife Habitat Appraisal, Soil Evaluation, and Plant Identification. The 2005 Arkansas Grassland Evaluation Contest will be held on April 27. The top five teams will travel to Springfield, Missouri, in early June to compete in the Mid-America Grassland Contest.

Funding: \$15,542.40
FTEs: .27 FTEs

HorseQuest.info

HorseQuest.info was developed through the cooperative effort of equine Extension specialists and associates at 13 land-grant universities in the Southern Region. Initial funding was secured for \$75,000 from USDA Agriculture Telecommunications/ADEC Awards. HorseQuest.info is an interactive web site that provides up-to-date information for horse owners. In 2004, HorseQuest.info received two national awards: 1) American Distance Education Consortium Bill Murphy/Barrier Buster Award and 2) Association for Communication Excellence Bronze Award.

Funding: \$1,017.60
FTEs: .02 FTEs

Delta HOPE (Healthy Options for People through Extension)

Delta HOPE is a tri-state (Arkansas, Louisiana, and Mississippi) collaborative effort addressing childhood obesity in the Mississippi Delta. The first year intervention in three Arkansas counties (Woodruff, Drew, and Ashley) reached 403 second-graders in 6 schools. Twenty-five teachers incorporated nutrition and physical activity education into core curriculum subjects an average of 3.7 times per week. The program, funded through a 4-year grant from the Kellogg Foundation, will be expanded to K-5th grades in the same schools in FY05 and to 6 additional schools in FY06. Abstracts were accepted for poster presentations at 2 national meetings. A 5-minute video was produced to promote the program to other schools.

Funding: \$23,746.88
FTEs: .41 FTEs

Master Farmer Program

Farm groups in Arkansas and others such as the Arkansas Association Conservation Districts (AACD) have asked assistance from the University of Arkansas Cooperative Extension Service in addressing environmental issues facing agriculture. The same request was made in Louisiana, and in response, the LSU Extension system has developed a comprehensive training program known as Master Farmer to help producers address water quality concerns. The Master Farmer program has the potential to help educate and motivate agricultural producers to positive actions towards lessening the impact of NPS pollution. Master Farmer efforts are jointly supported by the Southern Region Community Development Center and the states of Louisiana, Mississippi and Arkansas. These Extension-based organizations have cooperated in the development of plans and processes for the initiation of Master Farmer Programs in the three states. Louisiana has led in the development of a basic curriculum while Arkansas and Mississippi have been building infrastructure support for the initiation of new program efforts.

Funding: \$61,513.60
FTEs: 1.04 FTEs

National Network of Forest Practitioners

The National Network of Forest Practitioners is an alliance of rural people working on the ground to build a forest economy that is ecologically sound and socially just. Members include foresters, harvesters, Extension specialists, advocates, and policy makers interested in sustainable forestry. Participation in this network connects UA Extension to a broad-based clientele and positions us to have access to the latest information and issues about sustainable forestry

including marketing non-timber forest products. In 2003, an Extension forester was elected to the board and serves as the chair of the non-timber forest products working group of the NNFP. Currently other Extension representation includes New York, Tennessee, Virginia, and Colorado.

Funding: \$3,052.80

FTEs: .05 FTEs

Urban Forestry Council

The Southeastern Urban Forestry Council is comprised of urban forestry councils throughout the Southeast. Extension personnel from different states participate, including Georgia, Clemson, Arkansas and CSREES, participate in the Regional council through their local or state urban forestry council or organization. The Arkansas Urban Forestry Council is part of this larger umbrella organization. Extension faculty has served on the council board since 1994. AUFC is a nonprofit organization dedicated to the ecological preservation of urban and community trees. The council's role is to educate and promote good urban forest policies and management principles to Arkansas' communities. AUFC works at local, regional and state levels with citizens and public officials alike on important natural resource and tree care issues.

Funding: \$3,919.36

FTEs: .06 FTEs

National Web-Based Learning Center for Non-Federal Forest and Rangelands

The Center awarded grants to six states for developing web-based modules about topics of interest to forest landowners in the United States. The module titled "Developing a Wildlife Enterprise – Is It for You?" is being developed by a team of Arkansas and Mississippi Extension faculty. The module is scheduled for completion in FY05.

Funding: \$18,316.80

FTEs: .28 FTEs

NatureMapping

NatureMapping was co-developed in 1993 by leaders from the Washington Gap Analysis Project conducted at the University of Washington and the Washington Department of Fish and Wildlife. Five states including Iowa Extension have now taken strong leadership roles in NatureMapping, with approximately twelve more in stages of program adoption, including Arkansas. NatureMapping is an experiential learning program that promotes natural resource awareness using spatial technologies to inventory and monitor wildlife and associated habitats in the local community.

Funding: \$15,037.44

FTEs: .23 FTEs

Annual Conference of the Wildlife Society

This annual meeting of wildlife professionals includes representatives from state wildlife agencies, academia, Extension, and the private sector. Thousands of wildlife professionals from the United States and throughout the world attend this conference. The annual meeting is a forum for discussing issues of relevance through committees and working group meetings. Current research is presented in symposia and poster sessions. Professional development credits are obtained through attending symposia and workshops.

Funding: \$1,780.80
FTEs: .03 FTEs

National Fisheries and Wildlife Extension Specialists Conference

This tri-annual meeting of specialists facilitates information exchange among fisheries and wildlife Extension specialists throughout the country.

Funding: \$1,526.40
FTEs: .02 FTEs

Wildlife Damage Management Conference

The purpose of this bi-annual conference is to exchange information about the latest research and Extension activities pertaining to wildlife damage management. .

Funding: \$7,960.00
FTEs: .13 FTEs

4-H Wildlife Habitat Evaluation Program Invitational

The winning Arkansas state senior team of four youth and two coaches attended the national invitational. Arkansas will host the invitational in August 2005.

Funding: \$1,987.52
FTEs: .03 FTEs

Southern Region Program Leaders Network

The section leader for Agricultural Economics and Community Development participates in the Southern Region Program Leaders Conference for community development program leaders. Quarterly phone conferences are held to maintain communication and coordinate joint activities.

Funding: \$1,017.60
FTEs: .02 FTEs

Tri-State Community Development Initiative

This tri-state effort submitted a joint grant proposal to the Kellogg Foundation to conduct entrepreneurship training in the mid-south delta region.

Funding: \$3,561.60
FTEs: .05 FTEs

Southern Region Farm Management Marketing and Policy Committee Meetings

Specialists attending this conference gain valuable knowledge about Extension programs across the Southern region.

Funding: \$2,289.60
FTEs: .03 FTEs

Southern Dairy - Filth Fly IPM Program

Arkansas, Mississippi, and North Carolina are cooperating in a research and education program aimed at managing filth flies in southern dairies. Insecticide resistance and loss of available chemistry make fly management a top priority for southern dairies. These concerns will be addressed through research and education of county agents and dairymen on IPM strategies such as biological control, sanitation, population monitoring and compatible insecticide use.

Funding: \$5,954.56
FTEs: .09 FTEs

Assessing Biodiversity and Sustainable Management on Forest Lands

Arkansas participated in a workshop held as part of a national study funded by the National Commission on Science for Sustainable Forestry (NCSSF) and organized by the Sustainable Forestry Partnership. Workshops were held in Arkansas, Georgia, New Hampshire, Pennsylvania, Oregon, Minnesota, and Alabama. The project's goal was to collect, simulate, and disseminate information on biodiversity programs to forest managers across the continental United States. Participants included professionals interested in biodiversity and sustainable forest management, including federal, state, industrial, and private land managers, Extension agents, policy makers and scientists.

Funding: \$1,743.04

FTEs: .03 FTEs

ARK-LA-TEX Forestry Forum

The Ark-La-Tex Forestry Forum has been hosted by Louisiana Cooperative Extension Service of the LSU Agriculture Center for the past 20 years. Arkansas participated this year and was part of the program. Over 200 landowners from the tri-state area attended the one-day workshop.

Funding: \$508.80

FTEs: .08 FTEs

National 4-H Forestry Contest

The National 4-H Forestry Invitational is the national championship of 4-H forestry. Each year, since 1980, teams of 4-H foresters have come to Jackson's Mill State 4-H Conference Center at Weston, West Virginia, to compete in the four-day contest. The event is organized and conducted by a management committee comprised of Cooperative Extension Service specialists and agents, International Paper Company employees, and professional foresters from the U.S. Forest Service, the West Virginia Division of Forestry and forestry agencies from other state governments. Arkansas sent a team to the National Contest in 2004 and placed 6th in the contest.

Funding: \$3,438.40

FTEs: .06 FTEs

Society of American Foresters Ouachita Chapter Executive Committee

The Ouachita Chapter of the Society of American Foresters (SAF) includes members in Oklahoma and Arkansas. Arkansas is represented on the executive committee of the chapter and helps develop area programs for members of the chapter.

Funding: \$3,561.60

FTEs: .05 FTEs

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

Institution University of Arkansas Cooperative Extension Service
State ARKANSAS

Check one: Multi-State Extension Activities
 Integrated Activities (Hatch Act Funds)
 Integrated Activities (Smith-Lever Act Funds)

Actual Expenditures

Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
GOAL 1					
Program Area 1: Agronomic Crops	473,869	485,331	321,438	1,236,220.82	506,217 .37
Program Area 2: Livestock and Forages	268,335	264,509	204,421	585,407.72	112,508.69
Program Area 3: Poultry Production and Management	173,229	170,759	173,159	5,851.76	230,547.97
Program Area 4: Forest Management	52,243	51,498	20,285	32,997.77	110,563.63
Program Area 5: Horticulture Production & Management	381,325	391,543	330,142	459,558.86	112,144.33
Program Area 6: Alternative Agricultural Enterprises	46,845	46,177	33,916	17,122.53	37,719.33
Program Area 7: Agricultural Marketing	95,151	93,794	46,650	328,246.05	155,442.62
GOAL 2					
Program Area 8: Safe Food - From Farm to Table	182,481	179,878	129,746	48,343.24	186,654.64
GOAL 3					
Program Area 9: Improving Health	39,099	39,438	8,274	1,989,420.20	51,646.39
GOAL 4					
Program Area 10: Maintaining Ag Sustainability	42,250	41,647	79,299	25,922.91	592,401.79

Program Area 11: Animal Waste Management	33,863	33,380	58,234	9,520.00	29,518.89
Program Area 12: Cotton Pest Mgt. / Integrated Pest Mgt.	469,555	472,636	529,355	143,745.69	359,082.27
Program Area 13: Pesticide Applicator Training	3,403	3,354	5,756	49,870.13	117,771.03

Title of Planned Program/Activity	FY2000	FY2001	FY2002	FY2003	FY2004
GOAL 5					
Program Area 14: Imported Fire Ant Education	12,771	12,589	12,537	47,499.96	100,607.76
Program Area 15: Solid Waste Management	2,818	2,778	1,848	475,979.53	11,881.51
Program Area 16: Economic and Community Development and Public Policy Information	77,178	76,077	194,215	48,858.24	112,415.55
Program Area 17: Leadership and Volunteer Development	60,484	69,208	52,681	526,952.82	24,552.93
Program Area 18: Strengthening Families	29,757	30,230	133,682	109,898.51	38,324.99
Program Area 19: Managing Resources	35,802	36,189	1,635	10,584.98	49,840.90
Program Area 20: Developing Youth	155,851	170,408	139,567	1,114,035.96	168,866.53
Program Area 21: Managing Res. in Limited Res. Families	2,663	2,625	828	6,599.18	67,107.93
TOTAL	\$2,638,972	\$2,674,048	\$2,477,668	\$7,272,636.86	\$3,175,846.05

29,2005

Dr. Milo Shult
Director

March
Date

Form CSREES-REPT (2/00))

FY 2004 Report of Accomplishments and Results

**Arkansas Agricultural Experiment Station
Division of Agriculture
University of Arkansas**

March 2005

FY 2004 Annual Report of Accomplishments and Results

Introduction

The Arkansas Agricultural Experiment Station is the research arm of the Division of Agriculture, University of Arkansas system. The FY 2004 Annual Report of Accomplishments provides the necessary elements identified in the guidelines. For purposes of this reporting the 10 program areas identified in the Plan of Work submission under the five national goals have been condensed into the original five goals. Only selected key themes and specific examples have been included in this annual report and as such represent only a small cross section of our total research programs.

Contact person:

Dr. G. J. Weidemann

Dean, Dale Bumpers College of Agricultural, Food and Life Sciences
Associate Vice President for Agriculture - Research, Arkansas Agricultural Experiment Station

AFLS E 108
Agricultural, Food and Life Sciences
University of Arkansas
Fayetteville, AR 72701

PLANNED PROGRAMS

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

Arkansas continues to be the largest producer of rice in the nation and remains a major producer of soybeans, cotton, and soft red winter wheat. Fruits, vegetables and ornamentals remain a small but important part of the agricultural economy. While row crop farmers fared significantly better this year than in previous years, high input cost and asian soybean rust threaten these gains. Integrated research and extension teams, working closely with our commodity organizations and farm groups, continue to focus on developing improved crop production systems that are as efficient and cost effective as possible.

A new faculty member in animal science has been recently employed at our Southwest Arkansas research and extension center and will focus on forage issues.

Animal Systems

Beef and poultry production remain closely linked in Arkansas. Most beef operations are generally small in size and often are co-located with poultry production, with poultry litter being used as a fertilizer source for pastures. Animal waste management and potential nutrient runoff from pasture lands remain as significant challenges. A coordinated effort is underway to address phosphorus runoff and minimize potential impact on water quality. A new swine research unit funded by the Arkansas legislature has been constructed and is addressing animal waste issues in addition to research aimed at improving production efficiency. The facility has the capability to divert manure from the unit to separate holding ponds which makes it a one-of-a-kind facility for waste management studies.

The University of Arkansas works closely with the poultry industry to maximize production efficiency and address issues related to poultry health, food safety and waste management. Through the Poultry Center of Excellence, multi-disciplinary teams conduct basic research on poultry biology and genetics, nutrition, poultry health, and

food safety. The poultry health laboratory has the ability to address poultry diseases requiring high levels of containment and is one of the few non-federal laboratories capable of conducting this type of work.

Production Development, Processing and Engineering

Through the Institute of Food Science and Engineering, station scientists are working directly with the food industry to address research needs in food processing and food safety and assist in the development of new uses for raw agricultural products. The institute provides matching grants for direct collaborations with food industry partners. New funding from the state legislature as part of the tobacco settlement has been directed to create the Arkansas Biosciences Institute. A portion of these funds has been directed to address agricultural research with medical applications. Funding through the institute will give us the opportunity to greatly enhance our research efforts in agrimedecine, nutraceuticals and human nutrition.

FY 2004 Expenditures on Goal 1: \$40,243,845; Scientist FTE: 92.1

KEY THEME: BIOTECHNOLOGY

Situation

Because rice is a warm-season crop, it is sensitive to low temperatures. The period during which it is most likely to experience low temperatures is in the Spring during germination, the growth stage at which it is most susceptible to chilling injury. This can result in poor stand and low-vigor plants. In Arkansas this can be a key limiting factor in production.

Among 12 selected rice genotypes screened for low temperature tolerance, University of Arkansas scientists identified two with cold tolerance and selected one for further comparative evaluation with a temperature sensitive genotype. Two genes were identified as being induced by low temperature, "Low temperature induced" (*OsLti*) and "Sodium Lithium Tolerant" (*OsSlT*), and these genes were cloned and characterized. Each gene belonged to a small gene family, and each gene produced a protein with protective functions against stress-induced cell damage.

Impact

The results of this research directly impact breeding strategies and objectives in that molecular targets are identified that can be selected in an applied breeding objective to

improve tolerance to low temperatures. Molecular markers associated with cold tolerance will simplify screening of rice genotypes for tolerance, and will be invaluable in following transfer of critical genes from unimproved tolerant genotypes to elite genotypes of rice. Ultimately, producers will benefit from the availability of rice varieties that are genetically tolerant to cool temperatures. Less economic risk will be associated with early season periods of low temperature during the critical period of germination, seedling growth and stand establishment.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: PLANT PRODUCTION EFFICIENCY

Situation

Arkansas farmers produce eight percent of the rice grown in the United States under dynamic production conditions that differ from those in other rice-growing areas. Because of our prominence in this crop, Arkansas rice farmers depend on scientists with the University of Arkansas variety development program to provide a progression of improved varieties to meet the challenges of changing conditions in their fields and in the marketplace. Seventeen varieties have been released from the Arkansas breeding program since 1980. Each variety comes with management recommendations developed through research on plant nutrients, diseases, insect pests, weeds, and other areas. These recommendations help farmers tailor practices to the genetic potential of each variety. Genetic improvement in disease resistance, plant types, grain and milling yields, quality and other traits have helped increase yield and grain quality while controlling production costs.

Impact

Fifty-one percent of the rice grown in Arkansas in 2004 was of varieties developed in the Arkansas rice variety improvement program. When the program was started in 1980, the average rough rice yield in Arkansas was 4,110 lbs/acre compared to a record high average of 6,910 lbs/acre for 2004. Assigning a conservative value of 60 percent of this 2800 lbs/acre yield increase to new varieties, the average monetary gain in 2004, at a rough rice price of \$7.11/cwt, with the loan deficiency payment, would be \$119/acre or \$186 million for the 1.56 million acres grown in Arkansas, of which some \$94.9 million is due to the new Arkansas varieties.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: AGRICULTURAL COMPETITIVENESS

Situation

University of Arkansas Division of Agriculture has developed a team approach to monitoring and analyzing market and policy events in the global rice economy. Baseline 10-year projections of the major rice producing, consuming and trading nations are developed on the basis of a supply and demand simulation model, AGRM (Arkansas Global Rice Model). This framework provides estimates of production, consumption, trade, prices and stocks based on historical supply and demand relationships, policies, and macroeconomic variables such as population and income growth.

Impact

The research on the global rice economy and analysis of trade protection received considerable attention in 2004 from the World Bank, the United Nations and many policy decision-makers in the U.S. and the rest of the world. Domestic (USDA, ERS and FAFRI, Iowa State University) and international (World Bank, OECD, and Government of Japan) organizations have requested assistance from the AGRP team in developing their rice and market analysis. The model is being used to assess the impact of the U.S. proposal to WTO Doha Round trade negotiations.

The University of Arkansas' analysis is unique due to its recognition of both long and medium grain rice markets, which no other group conducts. It is unique because Arkansas researchers are not constrained to use 'official' government data or policies in analysis and therefore maintain a greater degree of objectivity. The beneficial outcomes of models include better production, processing, and consumption decisions by market participants and better policy decision-making by the U.S. and foreign governments.

Source of Funds

Hatch, state matching, USDA Special Grant

Scope of Impact

Multistate research

KEY THEME: PLANT PRODUCTION EFFICIENCY

Situation

This research was aimed at determining differences in profit-maximizing soybean seeding rates and associated re-planting stand count thresholds across maturity groups (MG). This study calculated profit-maximizing seeding rates by determining the seeding rate at which the marginal yield impact of one additional seed is equal to its cost. Yield was estimated as a function of stand counts taken one week after planting. Should a particular seeding rate be met with a lower than expected stand count due to soil crusting, flooding, etc., re-planting stand count thresholds were calculated such that partial returns to re-planting would exceed those attainable with a less-than-expected stand count from the initial planting. Partial returns to each MG were calculated as the yield times ten-year average price for the harvest week less seed and irrigation cost.

Impact

The results show that MG II to VI may be feasible MG choices once profit-maximizing seeding rate and irrigation costs as well as whole-farm production efficiency considerations are taken into account. Using conventional seed prices, average seed cost ranged from ~\$10/acre for MG VI to ~\$40/acre for MG 00. Raising seed cost by 50% reduced seeding rate recommendations by 20% regardless of MG. Re-planting stand count thresholds were quite low and later-maturing soybean offered less financial risk exposure compared to earlier-maturing soybean. Changes in irrigation cost and seasonal sale price did not measurably impact the choice of MG.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: NICHE MARKET

Situation

Current cultivars of blackberries all are floricanes fruiting, in that the crop is borne on the second year of the cane's life. The University of Arkansas Division of Agriculture released the first commercial primocane-fruiting blackberries in 2004. These unique cultivars named Prime-Jan™ and Prime-Jim™, fruit on both floricanes and primocanes, providing either double crops with fruit on both canes, or a late summer or fall crop on

primocanes. These cultivars are primarily recommended for home gardens and only limited commercial trial as their breadth of adaptation is not fully known.

Impact

These new unique cultivars can provide blackberry fruit in late summer until frost, an entirely new fruit ripening time for growers. These cultivars provide a fruiting time option not available in the U.S. prior to now. Fall fruiting, mechanical mowing of canes, elimination of overwintering cane pests, and other advantages are provided by these new blackberries. These cultivars and upcoming subsequent developments will provide the basis for a potential revolutionizing of blackberry production in the U.S. and worldwide.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: PLANT HEALTH

Situation

An integrated strategy for managing anthracnose in Bentgrass golf putting greens is being developed and disseminated to golf course superintendents. Several fungicides, including an experimental compound owned by the Arkansas Agricultural Experiment Station, have been shown to be effective against contemporary strains of the pathogen. For best results, applications need to be initiated before symptoms develop. Cultural practices such as mowing height, irrigation timing and amount, and fertilization affect disease severity and can be manipulated to manage anthracnose. Bentgrass varieties are being evaluated for resistance.

Impact

Utilizing effective management practices for anthracnose enhances the quality of Bentgrass putting greens, and this leads to greater golfer satisfaction, more rounds of golf, and increased revenue for courses. Eliminating unnecessary and ineffective fungicide applications reduces maintenance cost and environmental concerns.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate research

KEY THEME: ANIMAL PRODUCTION EFFICIENCY

Situation

One of the top issues in broiler nutrition is precision formulation, which deals with formulating diets that closely represent the needs of the broiler and attempts to minimize the excretion of excess nutrients such as nitrogen and phosphorus.

A team of scientists, including a nutritionist and a processing expert, conducted research in 2004 in which broilers were fed commercial-type diets that were adequate or low in phosphorus, with or without dietary phytase.

Impact

University of Arkansas research illustrates that phytase may be used in combination with low-phosphorus diets throughout the entire grow-out period of broilers, potentially reducing dietary costs and phosphorus excretion (an environmental benefit) without sacrificing performance or increasing the incidence of broken bones, which is an economic and welfare issue. These data illustrate to poultry nutritionists that environmental and cost benefits are available without consequent processing or welfare problems. It is expected that once this phytase product is widely available for distribution, most if not all commercial broiler diets will include phytase, with a subsequent decrease in the amount of phosphorus that reaches the environment and a reduction in dietary cost.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate research

KEY THEME: ANIMAL HEALTH

Situation

Autoimmune disease is the result of a specific attack by the immune system against an individual's own body components, frequently resulting in the destruction of the target tissues. Mechanisms leading to autoimmune disease are not well understood and appear to involve many factors. The Smyth line (SL) chicken is the only animal model for human autoimmune vitiligo, an autoimmune disease involving the destruction of pigment cells and loss of pigmentation in the skin.

Impact

Arkansas scientists discovered altered antioxidant capacity and heightened oxidative stress in the feather target tissue prior to and during active SL vitiligo. Particularly, heightened lipid peroxidation, which greatly affects lipid membranes and the function of cells, was observed prior to and during the onset of SL vitiligo. Moreover, studies on pigment cells in culture also revealed a higher level of lipid peroxidation in pigment cells from SL chickens compared to those from control chickens. It is hypothesized that this susceptibility of the SL pigment cell to oxidative damage makes it particularly sensitive to activities in its local environment.

The use of an animal model that is genetically susceptible to develop autoimmune disease and requires an environmental factor for expression of the disease provides an excellent opportunity to study the cause and effect relationship between genetic susceptibility and the factors leading to the onset and expression of autoimmune disease.

Source of Funds

Hatch, state matching, NIH

Scope of Impact

Multistate research

KEY THEME: GRAZING

Situation

The majority of expense associated with producing beef calves results from the production, harvesting, and storage of hay and purchasing of concentrate-based feeds to maintain cows. Decreasing stored feed requirements of beef cows is a topic that has received considerable attention in recent years; however, beef cattle producers in the southern United States still winter cows primarily with hay, plus a concentrate-based, high protein supplement.

Arkansas researchers designed a complementary forage system using the limit-grazing of winter-annual and tall fescue pasture infected with a non-toxic endophyte that was intended to supplement gestating and lactating beef cows and decrease hay requirements.

Impact

Cows limit-grazed on tall fescue pasture two days/week seemed to maintain body weight as well as cows supplemented on rye/ryegrass pasture. However, it was noted that tall fescue did not produce additional calf gain per cow as compared to those exposed to rye/ryegrass pasture. Because the use of limit grazing perennial grasses produced cows that were as efficient as cows grazing rye/ryegrass pasture, the cows grazing perennial pasture should have a lower production cost.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate

KEY THEME:

ANIMAL HEALTH

Situation

Concern about antibiotic-resistant pathogens has led to increased pressure to discontinue the use of antibiotics in animal feed as growth promotants. Studies investigating the presence of antibiotic-resistant bacteria in swine herds have been performed, and the Danish Integrated Antimicrobial Resistance Monitoring and Research Program has recently reported that discontinued use of antibiotics in swine herds has led to a decrease in antibiotic-resistant bacteria. In response to this pressure, there has been a demand for a replacement for antibiotics in feed. It is believed that probiotics, which are also known as direct-fed microbials, may provide an alternative for antibiotics in feed. Probiotics are bacteria that are normal inhabitants of the digestive tract and have been shown to increase growth and immune capabilities. One group, the lactic acid bacteria, has been studied widely and may offer an alternative to antibiotics.

Impact

University of Arkansas researchers have found that administration of direct-fed microbials such as lactobacilli and *Bacillus* strains, may be a more direct approach to alter the intestinal microflora and decrease populations of bacteria having a negative impact on pig performance than antibiotic supplementation. Directly altering the microbial colonization of the intestinal tract could be a means to improve swine growth and efficiency, by reducing the level of specific pathogens while establishing a more diverse microbial population. This could decrease or eliminate the industry's reliance on growth-promoting levels of antibiotics.

Source of Funds

Hatch, state matching

Scope of Impact

Multistate research

KEY THEME: ANIMAL HEALTH

Situation

Filth flies (Diptera: Muscidae), such as those that breed in faeces and other organic refuse, have been documented as vectors of pathogenic bacteria including *E. coli* O157:H7, that cause hemorrhagic colitis in humans, and *Campylobacter*, which is the principal causative agent of human enteritis. Recently, a molecular diagnostic technique has been developed to identify filth flies that have been exposed to bacterial pathogens using PCR. We used this molecular diagnostic technique to conduct a surveillance of filth flies carrying *Campylobacter* sp. and *E. coli* O157:H7 from two Arkansas turkey facilities.

Impact

Based on University of Arkansas research, it is clear that house flies and black garbage flies are carriers of *E. coli* O157:H7, and *Campylobacter* spp. within the turkey, cattle and human components of the agri-ecosystem. Filth flies have a high potential for the distribution of many pathogens into the human population living in close proximity to animal production facilities that harbor fly populations. Future studies will be implemented to determine the disbursal of filth flies among the production animal and human components of the agri-ecosystem.

Source of Funds

Hatch, state matching, USDA Special Grants

Scope of Impact

Multistate research, Indiana, and Virginia.

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

Food safety continues to be of utmost concern to most consumers with periodic well-publicized incidents maintaining a continual level of concern among consumers. Several product recalls in recent years have included Arkansas-based companies. The Food Safety Center within the Institute of Food Science and Engineering was created to focus multi-disciplinary research on food safety issues. The University of Arkansas has participated in a coordinated research effort with Kansas State and Iowa State as part of the Food Safety Consortium. Over the past decade consortium scientists have addressed major issues of the pork, beef and poultry industries related to food safety. The University of Arkansas also is a charter member of the National Alliance for Food Safety. The university has created a number of internet-based, not-for-credit teaching modules on food safety and quality for use by the food industry regionally and nationally. When complete, 10 six-week modules will be available to the food industry.

FY 2004 Expenditures for Goal 2: \$4,428,614; Scientist FTE: 10.1

KEY THEME: FOOD SAFETY

Situation

Campylobacter is the one of the most commonly reported bacterial causes of human food-borne infections in the United States with an estimated 2.1 to 2.4 million cases reported annually. Epidemiological evidence indicates that a significant proportion of human infections result from the improper preparation of poultry products. Numerous studies have shown that a substantial number of retail chicken and turkey products are contaminated with *Campylobacter*. How *Campylobacter* is transferred between breeder flocks and progeny is unknown but one potential mechanism of contamination which has received little attention is the possibility of pathogens introduced via the reproductive tract into fertile eggs.

Campylobacter was isolated from more than 90% of the pooled semen samples and female reproductive tracts obtained from turkeys on commercial production farms. Artificial insemination is used extensively for commercial turkey reproduction. Semen from multiple toms is pooled and then used to inseminate multiple hens, and therefore may be a critical source of *Campylobacter* contamination in turkeys. In an effort to reduce the incidence of *Campylobacter* contamination, procedures were tested to reduce *Campylobacter* in pooled turkey semen utilizing antibiotics and alternative semen-

washing techniques or modified environments. Results indicate that the most effective treatment against *Campylobacter* was the treatment of pooled semen with a cocktail of antibiotics.

Impact

These results demonstrate that turkeys have a significant incidence of *Campylobacter* colonization in the reproductive tracts of males and females and in the semen of toms. These data further support the possibility that *Campylobacter* is vertically transferred in poultry. This is an important finding as commercial turkey production relies on artificial insemination and the random pooling of semen may be a source of *Campylobacter* contamination. The use of antibiotic combinations in pooled turkey semen may decrease *Campylobacter* contamination of offspring and reduce the potential for food-borne illness in humans.

Source of Funds

Hatch, State matching, USDA Special Grant

Scope of Impact

Multistate research

KEY THEME: FOOD-BORNE PROTECTION

Situation

There is continuing concern among U.S. regulatory agencies with regard to the use of antibiotic drugs in food-producing animals. While some of these concerns are perhaps not well-grounded, it is clear that continued restrictions on antibiotic drug use will be placed on farm production of poultry and food animals.

A team of Division of Agriculture scientists has improved upon an existing concept of competitive exclusion, out-competing disease-causing organisms in the intestinal tract of birds. Using a novel laboratory screening technique, a combination of safe and beneficial organisms were selected. Investigations have shown that these organisms may markedly reduce *Salmonella* shedding in commercial poultry flocks and may effectively substitute for antibiotic therapy for treatment of some enteric diseases. Laboratory trials have indicated that these combinations were effective at reducing *Salmonella* contamination in

chicken crops, the major source of carcass contamination at processing, prior to slaughter.

Impact – These technologies may provide new cost-effective opportunities for the replacement of certain antibiotics in commercial poultry and also for reducing the impact of poultry-borne causes of food-borne illness in humans.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research

KEY THEME: FOOD SECURITY

Situation

University of Arkansas scientists have successfully developed a powerful genomic method for simultaneous identification of bacterial genes that are required for survival during infection in a host animal. As a demonstration, this method, called transposon signature profiling, was applied to a chicken infection model with *Salmonella enteritidis*.

Impact – This genomic method should find broad applications to many other bacterial species that are important for agriculture in the United States. We expect that whole genome scanning of a bacterium using this approach could be conducted in a matter of a few weeks to determine gene requirements during animal infection. We expect that identification of the factors in foodborne pathogens should provide insights on how they infect farm animals, persist in the tissues, and eventually contaminate the animal food products.

Source of Funds

Hatch, State matching, USDA Special Grant

Scope of Impact

Multistate

KEY THEME: FOOD-BORNE PROTECTION

Situation

Edible films can protect fresh produce from microbial spoilage, delay ripening, and extend shelf life. Antimicrobial substances incorporated into these films to control the survival of pathogens on the surface of fresh produce should not have adverse effect in masking the color of fresh produce.

A Division of Agriculture research team has produced numerous films for various food applications including various fruits and vegetables, meats, and poultry products. The team has produced films and coated tomatoes and carrots (baby, and cooking-type) without masking the color, and has extended shelf life without altering the texture, and eating quality.

Impact – Edible films are biodegradable, unlike non-degradable synthetic products. Edible films can find numerous applications, including delivering effective antimicrobials to the surface of food products, and can find applications in pharmaceuticals, nutraceutical and functional foods, processed food products, fruits, vegetables, meat, poultry and egg products.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate

KEY THEME: FOOD-BORNE PROTECTION

Situation

Conventional microbial detection methods are time-consuming and expensive and they cannot match rapid food processing and distribution systems. To minimize product recalls, clear international trade barriers due to microbial contamination, and to ensure

food safety, the food industry needs rapid, sensitive, and specific methods to detect pathogens in food products on line or even in real-time.

Impact - An immuno-electrochemical biosensor system coupled with immuno-magnetic separation has been developed for detection of *S. Typhimurium* in chicken carcass wash water. The method can enumerate Salmonella in two hours with a detection limit of 1×10^2 cell/ml. A bienzyme electrode was developed for the biosensor system to improve sensitivity. A capillary bioseparator/bioreactor was also developed to enhance the binding efficacy of antibodies/antigens and the enzymatic reaction, and to design an automated instrument, which resulted in the detection limit of 10 CFU/ml for *E. coli* O157:H7. The results of this project will provide food processors with new technology to detect pathogens in foods in less than two hours with acceptable detection limits (10 cells/ml).

Source of Funds

Hatch, State matching

Scope of Impact

Multistate Research

Goal 3 – A healthy, well-nourished population.

Arkansas ranks high nationally as a state with significant nutrition-related health problems linked to poor diet and obesity, especially among under-served populations. The strong social aspects of this problem make this a difficult issue to address, and Arkansas has made little progress in reducing diet-related health problems. The state legislature has directed that a portion of the state tobacco settlement funds be used to address tobacco-related health effects through a research institute created for that purpose. A portion of these funds will be utilized to conduct agricultural research that improves human diet and health.

FY 2004 Expenditures for Goal 3: \$1,062,665; Scientist FTE: 2.4

KEY THEME: NUTRACEUTICALS

Situation

Conjugated linoleic acid (CLA) inhibits carcinogenesis, atherosclerosis and promotes weight loss. CLA is found in dairy and meat food products and is formed as a result of fermentation in the cattle rumen and deposited in muscle and milk. It would be possibly inadvisable to obtain higher levels of CLA by increasing dietary meat and dairy foods since increase of dietary dairy and meat products would also be associated with increased saturated fat intake. Therefore, alternative CLA sources, such as unsaturated oils or low-fat foods, would be desirable.

Impact

University of Arkansas scientists produced a CLA rich soy oil by simply exposing naturally occurring linoleic acid in soy oil to ultraviolet light in the presence of a catalyst. Oil CLA levels were similar to those found in dairy and meat products. The CLA soy oil, an unsaturated oil, is perceived as a “healthier” plant lipid source than animal products. This will broaden the range of foods in which CLA can be obtained and allow the incorporation into a variety of baked and fried processed products.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research

KEY THEME: HUMAN HEALTH

Situation

The majority of Americans use some form of dietary supplement. These products, which include a vast array of compounds including medicinal herbs and vitamin and mineral supplements, are taken to both enhance the nutrient content of the diet and for their pharmacological effects.

Evaluating dietary supplement safety requires laboratory research, human clinical trials and consumer education. All of these areas are being addressed by University of Arkansas research.

Impact

Addressing dietary and supplement safety will have a direct benefit to consumers and the dietary supplement industry. Consumers will be able to use dietary supplements as appropriate and safe adjuncts to medical care. As consumer confidence in these products increases, the dietary supplement industry will realize consistent and increased sales. Dietary supplement suppliers, many of whom are involved in the agricultural production of the products will benefit from an increased and diversified market for their raw materials. Information regarding the safety and efficacy of the products can be used by governmental regulators to develop and enforce appropriate standards for the manufacture, sale and use of dietary supplements.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research

KEY THEME: NUTRACEUTICALS

Situation

Epidemiological studies suggest that consumption of high levels of antioxidant vitamins and phytochemicals in fruits and vegetables may reduce the risk of cancer, cardiovascular disease, and stroke. Carrots, a highly nutritious vegetable, are commonly consumed in several forms, raw, fresh-cut, frozen and canned, but little information is available on how different preservation and storage methods impact their antioxidant capacity.

The phenolic content and antioxidant capacity of fresh-cut carrots increased readily over 21 days storage. The phenolic content of fresh carrots remained stable during six months of storage at 4°C and was significantly higher than that of canned and frozen carrots. The antioxidant capacity of all raw and processed carrot samples correlated highly with phenolic content, indicating that raw carrots are a better source of antioxidants than frozen or canned carrots.

Impact

The results indicate that stored fresh-cut carrots are an excellent source of phenolic antioxidants that are formed in response to wounding. These findings suggest that there may be potential health benefits associated with consumption of fresh-cut carrots. Raw carrots were found to be a better source of phenolic antioxidants than frozen and canned carrots.

Source of Funds

Hatch, State matching, USDA – NRI

Scope of Impact

Multistate research

Goal 4 – Greater harmony between agriculture and the environment.

As the natural state, Arkansas has abundant natural resources, and outdoor recreation is important to residents and tourists. Intensive crop and animal agriculture make it imperative that plant and animal production systems have minimal impact on our natural resources. In our row crop areas soil quality and water availability remain critical issues. A number of our most productive rice-producing areas have been designated as critical water use areas and salinity is becoming an increasingly common problem. Multi-disciplinary research and extension teams have been working with farmers to address problems over the short-term, but a coordinated long-term effort is needed. Research partnerships are emerging with neighboring states to address these issues in a coordinated fashion.

The size of the poultry, swine and cattle industries in Arkansas has made waste management a critical issue to ensure that our water resources are protected. Multi-disciplinary research and extension teams have addressed the phosphorus issue related to poultry litter. Long-term test sites have been established to address phosphorus runoff that will establish a research base for voluntary monitoring and mitigation in collaboration with the industry and producers. A new swine research facility has been constructed that can segment the waste stream for nutritional and environmental studies.

Although long term comprehensive pesticide monitoring has shown little impact on our ground water resources, reduction of chemical inputs through pest management programs remains a high priority.

FY 2004 Expenditures for Goal 4: \$7,441,948; Scientist FTE: 21.9

KEY THEME: AGRICULTURAL WASTE MANAGEMENT

Situation

Many producers in eastern Arkansas, who typically grow soybeans in a wheat-soybean double-crop system, choose to burn wheat residue immediately after harvest as a means of seedbed preparation. Burning residue adds a considerable amount of carbon dioxide to the atmosphere and prevents the return of much needed carbon to the soil. Alternative wheat-residue management practices have the potential to be as, if not more, environmentally sound, economical, time-efficient, and productive as the traditional practice of burning wheat residue prior to growing a soybean crop. Alternative wheat-

residue management practices may also improve the quality of the soil resource in the delta region of eastern Arkansas.

A three-year research project has been completed at two locations in eastern Arkansas to evaluate the effect of wheat-residue management practices on soybean growth and development and soil quality.

Impact

University of Arkansas researchers have found that, since similar yields were realized, the adoption of no till (NT) over conventional till (CT) practices may be more cost-effective. In addition, avoiding residue burning is a practice that does not negatively affect soybean production in the wheat-soybean double-crop system in the mid-South. Though somewhat inconsistent between locations, largely due to inherent soil properties differences, the results of this study indicate that, in a wheat-soybean double-crop production system in a relatively warm and wet environment, some soil-quality-related parameters can be improved more under NT than CT and more when crop residues are left unburned than when they are removed by burning.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research and extension

KEY THEME: NATURAL RESOURCE MANAGEMENT

Situation

Forest lands in Arkansas provide a multitude of economic benefits for the state, including wood fiber, hunting and fishing opportunities, and tourist-related activities. While some forest tracts are well suited for high-intensity timber production, other areas on both public and private lands present logistical and sometimes political obstacles to intensive timber management.

To determine if anecdotal evidence that skidding with draft animals reduces the impact of timber harvesting on the residual forest, a study was initiated in the Ozarks to compare residual stand damage between a rubber-tired skidder operation and a system that utilized

mules to skid logs to landings. The extent and severity of damage to residual trees and soil compaction both were assessed following harvesting operations.

Impact

The results of this case study showed pronounced differences in the extent and severity of damage to residual tree boles, and the extent of soil compaction also was dramatically different between skidding methods. The damage to residual boles was three times greater on the site where logs were skidded with a rubber-tired skidder. The greater number of damaged stems also resulted in a higher total area of exposed cambium, which reduces the grade of residual logs and predisposes the stand to additional damage from insects and pathogens. Unexpectedly, there was no significant difference in the severity of soil compaction between the rubber-tired skidder operation and the mule skidder operation. However, the total area disturbed and compacted during skidding was greater on the rubber-tired skidder site. The data clearly indicate that skidding with draft animals does minimize both the extent and severity of residual tree damage and the extent of soil compaction compared to rubber-tired skidder operations.

Source of Funds

Hatch, McIntire Stennis, State matching

Scope of Impact

Multistate Research

KEY THEME: WATER QUALITY

Situation

Pesticides aid in the production of food and fiber. However, there is also the potential for contamination of surface water. If environmentally harmful amounts of pesticides begin to appear in surface water, early awareness of the situation would make it easier to remedy.

For several years we had been monitoring water on the Mississippi, Arkansas, White, St. Francis, and L'Anguille rivers for pesticides used in rice production.

Impact

It is not unusual to detect low levels of pesticides in surface water in an agricultural area, especially during the growing season, since pesticides need some water solubility to be effective. The study has not observed any trends toward increasing frequency or amounts of pesticides in the rivers at the sites sampled in previous years. These results indicate

that production practices as they are now being done in the rice growing areas do not seem to be having an adverse effect on the surrounding water due to pesticide contamination.

Source of Funds

Hatch, State matching

Scope of Impact

State specific

KEY THEME:

FOREST RESOURCE MANAGEMENT

Situation

Most landowners who sell their timber with the aid of a forester have the wood volume estimated in either board feet or in cubic feet. Industrial facilities buy the resulting logs on a weight basis. Conversion factors such as pounds per cubic foot or tons per 1000 board feet are used to estimate wood weight from wood volume estimates. Wood volume does not change with moisture content but wood weight does. If wood moisture content in the trees were to change with the season of the year, then wood weight of the resulting logs would change also. Therefore, the monetary value of the logs would change with the season.

A study was initiated in the fall of 2003 and extended through summer of 2004. Eight loblolly pine pulpwood stands were visited four times, once during each season (fall, winter, spring, and summer). At each stand, during each visit, six trees were cut and delimbed. The weight as well as various diameters and length of each tree length log were recorded. Bulk density (green weight per cubic foot) values were calculated for each log.

Impact

If landowners were to sell their timber by weight at the mill, it would be to their advantage to harvest in the spring. The logs would be the heaviest for the year and some mills offer a premium for stands that can be harvested during wet conditions. If the stand cannot be harvested in the winter or spring because of wet conditions, it would be best to harvest in the fall before the wet conditions when the tree may be heavier than in the summer. Stands that can be harvested year-round may receive a premium if harvested in the winter over stands that can be harvested only in dry weather. This premium may be negated by the trees being the lightest at that time.

Source of Funds

Hatch, McIntire Stennis, State matching

Scope of Impact

Multistate research

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

Arkansas remains a rural state with a low average annual income nationally. Although several areas of the state are undergoing dramatic growth, many rural areas are dealing with declining populations, limited job opportunities and declining community services such as health care. The aging population creates particular problems in rural areas where access to quality health care and other services are limited. Multi-disciplinary research and extension programs have addressed many of these issues and have provided information to local communities and to policy makers as they work to address some of these endemic, complex problems.

FY 2004 Expenditures for Goal 5: \$1,762,326; Scientist FTE: 8.9

KEY THEME: AGRICULTURAL FINANCIAL MANAGEMENT

Situation

Farm bankruptcy and financial stress are of vital concern to production agriculture. Over the twentieth century there have been two waves of high levels of farm bankruptcy. The first came in the early part of the twentieth century during the 1920s and 1930s as farmers first adjusted to the post WWI recession in agriculture and then the devastation of the 1930s. The second wave of farm-financial distress came in the early 1980s following the boom of the late 1970s. As a reaction to the farm financial crisis of the 1980s, Congress enacted Chapter 12 for the family farm. This legislation enables farm families to file financial reorganizations on terms more favorable than those previously available to farm families under Chapters 11 and 13. Chapter 12 has always been temporary legislation and continues as such.

Impact

Estimation results indicate the importance of economic factors in determining the Chapter 12 usage rates. Economic factors are significant. Increasing farm debt-to-asset ratios and state-level unemployment rates are positively and statistically significantly related to the ratio of Chapter 12 filings to the number of farms. Net farm income increases lead to lower filing rates. Social factors do not seem to be important in contrast to some findings for Chapter 7 and 11. The only significant social factor was proportion of farmers over 65. The findings indicate that as the proportion of farmers over 65 increases, filing rates decline. This likely implies that older farmers are in less precarious

financial circumstances than younger farmers and therefore less likely to need the protections of Chapter 12.

Government payments were found to be negatively associated with filing rates. This seems to indicate a positive role for government assistance in preventing bankruptcies. However, such payments are likely anticipated by both borrowers and lenders. The key role of government payments might be payments that are unanticipated that frequently come in periods of low prices such as the case in the late 1990s and early 2000s.

Source of Funds

Hatch, State matching, USDA Special Grant

Scope of Impact

Multistate research

KEY THEME: AGRICULTURAL FINANCIAL MANAGEMENT

Situation

Nearly all broilers produced in the United States are grown under contract arrangement between broiler producers and integrated poultry companies. Extensive research addressing the pros and cons of the contracting arrangements has been pursued. Though some of the historic research has dealt with grower returns, much of the recent research has focused on specific allocation of input and output price risks and management risk between growers and integrators.

Impact

Results indicate that contract broiler production continues to be competitive with other farming operations, especially compared to options available for small family farms. The lower volatility of poultry production compared to other options also makes it an attractive alternative. These results can be used for insight into the approximate investment requirements and expected annual costs and returns of the business. Lending institutions can use these results in evaluation of loan applications for enterprise establishment or expansion. Broiler producers and integrated poultry companies can also utilize these results to compare costs and returns with past years and evaluate both the future state of the existing industry and opportunities for expansion.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research

KEY THEME:

CHILDREN, YOUTH, AND FAMILIES AT RISK

Situation

Women have made up a significant portion, and at times a majority, of America's drug users and addicts. Yet, historically, drug abuse research has focused primarily on men. Recent statistics for women's substance abuse indicate that almost half of all childbearing women, ages 15-44, have used illicit drugs at least once in their lives; 1.2 million women have taken prescription drugs for nonmedical purposes; approximately 4 million women use illegal drugs and need treatment for drug abuse.

Among all illicit drugs, methamphetamine abuse is on the rise, particularly by women of child-bearing age. Regionally, Missouri and Arkansas have the second and third highest number of methamphetamine lab seizures in the United States, only surpassed by California. Some of the social problems associated with methamphetamine abuse include increased crime, law enforcement and prison expenditures, mental health problems, domestic violence, child abuse and neglect, and drug-exposed children.

Based on a review of the literature, Bronfenbrenner's ecological theory was to examine how women's substance abuse is determined by multiple risk factors related to personal history (e.g., heredity, mental health), relationship factors (e.g., family, partner's substance abuse, family violence), community factors (e.g., poverty, stress, availability of treatment), and the larger social culture (e.g., values and beliefs).

Impact

While it is not possible to identify and discuss all the relevant factors related to a woman's substance abuse, some interesting themes emerged in this research. Regarding a woman's personal history, approximately 30-50% of substance-abusing women in treatment studies also tend to have comorbid psychiatric conditions such as depression and anxiety. However, women's mental health problems are just as likely to precede as to follow substance abuse treatment, suggesting a complex interaction between genetic markers for substance abuse and environmental factors.

Cultural values and beliefs indicate there is a double standard regarding women's intoxication and drug use relative to men's; there is more social disapproval for female intoxication as expressed by both men and women, and across all social classes. Results of this research review of women's substance abuse help to inform the on-going study of methamphetamine abuse among rural women.

Source of Funds

Hatch, State matching

Scope of Impact

Multistate research

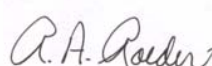
Community Development	147,069	146,906	23,933	24,650	25,389	26,151
Total	2,088,420		2,317,663	2,369,477	1,911,210	1,968,542 2,027,593

3/23/05

Date

Form CSREES-REPT (2/00)

Director



Stakeholder Input Process

Our stakeholder input process has not changed from that described in our state plan of work. We continue to use formal and informal means to seek input from all stakeholder groups. The Division of Agriculture maintains an advisory committee of stakeholders that meets regularly to provide a forum for discussion and input on issues of importance to the stakeholder community. For farm-related stakeholders, public comments are solicited at county meetings and from farm-related associations. Stakeholder-developed materials, such as the Farm Bureau policy development process are used to identify research needs that may not be adequately addressed. Each year research and extension scientists meet with administration to discuss producer needs solicited at meetings throughout the year. Identified needs are integrated into the research planning process to ensure program relevance. Several departments and many of our institutes and centers maintain external advisory boards that provide direct feedback to the unit on the specific research or educational program.

Several priority-setting activities are scheduled each year with specific commodity or stakeholder groups to seek input on the research planning process. Stakeholder representatives serve in most policy setting groups or program reviews to ensure that the public has a voice in the decision-making process and in program evaluation. Special meetings are held as needed to address major issues impacting any stakeholder group.

Stakeholder input remains vital to ensuring program relevance and each year programs are adjusted to address identified needs.

Program Review Process

There have been no changes in our program review process since submission of our five-year plan of work.

Success of Multi and Joint Activities

The Arkansas Agricultural Experiment Station maintains a number of formal and informal mechanisms to ensure multistate, multi-institutional and multidisciplinary collaborations as well as joint research and extension efforts.

Numerous multistate collaborations take place through the regional project system. In addition, Arkansas is part of a number of multistate consortia and direct research collaborations. For example, Arkansas is a member of the multistate animal waste consortium that is addressing animal waste issues and environmental quality on a national basis. Arkansas has been part of the Food Safety Consortium along with Iowa State and Kansas State for over a decade. This research consortium has had a national impact on food safety issues.

All rice-producing states collaboratively share rice germplasm and conduct regional evaluations through the rice regional nursery. A formal agreement has been developed that facilitates germplasm exchange yet protects the public investment in these breeding lines. This system has ensured the rapid use of rice genetics throughout the U.S.

Numerous other multistate and multi-institutional research collaborations exist that address regional or common problems. Many of these collaborations have been identified elsewhere in this report, such as the functional foods program with Oklahoma and Louisiana.

Multidisciplinary activities have been facilitated through the development of research institutes and centers at the University of Arkansas. These include the Poultry Center of Excellence that includes disciplines such as economics and engineering in addition to poultry science, and the Institute of Food Science and Engineering that brings together food scientists, engineers, microbiologists and nutritionists to address common problems faced by the food industry. In row crops research, joint research/extension production management teams meet regularly to jointly plan research activities. Often these activities include stakeholder input to ensure program relevance. Single-issue meetings are held as needed to address emerging issues and to craft a research plan to promptly address the problem. These activities also serve to ensure close collaboration with extension counterparts.

Integrated Research and Extension Activities

The Arkansas Agricultural Experiment Station ensures integration of research and extension activities through the use of jointly appointed positions and numerous joint program planning activities. Joint positions are evaluated annually and changed as needed to ensure the appropriate balance between research and extension activities. Examples of progress for each of the planned program activities are provided that accompany the program activities listed on the included form CSREES- REPT.

For plant and animal production (includes plant and animal production, plant and animal genetic improvement, plant protection, and animal health), joint program planning occurs annually by commodity in addition to specific program planning activities that address specific problems or production systems. In most cases, department heads also serve as the extension section leader to ensure program integration. In other cases, the department head and section leader work closely together to ensure program coordination.

Most institutes and centers include both research and extension faculty that work together in multidisciplinary teams. For example, product development and processing is addressed through the Institute of Food Science and Engineering. Through the Institute, research and extension scientists collaboratively address both large and small food industry firms.

Food safety is addressed through the Food Safety research center within the Institute of Food Science and Engineering, Poultry Center of Excellence and the Food Safety Consortium as well as direct collaborations with the food industry. Many issues are addressed by joint research and extension teams in a collaborative effort. Extension food safety scientists are co-located with AES and USDA scientists in the Poultry Center of Excellence.

Natural resource conservation is addressed by joint extension and research teams in collaboration with state government. Joint programs exist dealing with animal waste, water quality, soil quality and other issues. A joint research-extension task force has been formed to address environmental issues and to serve as a resource for state agencies.