Contents

Executive Summary

Urban Pest Management and West Nile Virus
Weed Management in Arkansas Crops

Natural Resource Management
Forestry Continuing Education

Pesticide Application
Precision Chemical Applications

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

Water Quality
Watershed Education

Wildlife Management
Wildlife Management on Private Lands

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

Character/Ethics Education
Raising Arkansas Youth (RAY)

Child Care/Dependent Care
The Best Care: Best Care Connected; Best Care Myths and Magic

Children, Youth and Families at Risk
The Adolescent Sexuality, Pregnancy and Parenting Program

Community Development
The Cooperative Extension Service Home-Based Business Program
Citizen Action Produces Strength
Local Government and Public Issue Education Program
National Institute on Cooperative Education (N.I.C.E)
University of Arkansas Farm Income Tax School
VISION 2010 Program – Building Healthy, Sustainable Communities for the 21st Century

Family Resource Management
Money 2000
Money & You
Youth Financial Management

Farm Safety
Farm Safety Programs and Farm Accident Rescue Workshops

Impact of Change on Rural Communities
Planning for Economic Development

Parenting
Guiding Children Successfully

Workforce Preparation
Mini-Society Camp

Youth Development/4-H
Arkansas AG Adventures
Citizenship Washington Focus
Developing Youth
ExCEL: Experience the Challenge Experience the Leadership
4-H Responsible Environmental Stewardship-Quest (4-H RES-Q)
Kansas City 4-H Global Conference
Regional and State 4-H O-Rama
State 4-H Camp
Program Response:
Youth Leadership
Youth Community Service

Management Goals

Communications
Mass Media Education Programs
Print Media Programs
Support Material

Information Technologies
Agriculture Decision Tools
http://www.uaex.edu
In-Service Training System

Arkansas Agricultural Experiment Station FY2002 Report of Accomplishments

Executive Summary

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, 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 works:

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

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:

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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 12.3 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 47 percent of the country's rice production, with an average yield of 143 bushels per acre. Areas of educational emphasis included rice variety selection, groundwater management and conservation, nutrient management and controlling of rice diseases. In 2002, Arkansas recorded the highest rice average yield in history. This was attributed to improved varieties, improved management practices and favorable weather. The Rice Verification Program increased rice yields from 11 to 47 bushels per acre, resulting in an average net return of $100 per acre.

Arkansas ranks fifth 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. Conventional till acreage was reduced from 65 percent to 41 percent since 1999. The Cotton Verification Program 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.

Largely weather, but also pest management, impacted soybean production in Arkansas. Irrigation techniques and fertility problems had impact on production. Arkansas produced an average yield of 34 bushels per acre, which ties the record set in 1994. Only 60 percent of the soybean acreage was irrigated and 76 percent of the acreage was produced using transgenic soybeans. The 2002 Soybean Research Verification Program consisted of 23 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 yields per acre for these fields ranged from 37 to 58 bushels, depending on the management system evaluated.

Feed grain crops (wheat, corn and grain sorghum) were planted on 1.47 million acres in 2002. Arkansas wheat farmers harvested 840,000 acres of wheat, averaging 46 bushels per acre. The annual Wheat Quality Tour in May visited a grain buyer, processor and other interesting facilities. The Wheat Research Verification Program included 14 fields in 2002 and, through improved management, improved yield per acre by 37 percent over the state's average. A study was conducted to evaluate the new genetically modified technologies in corn hybrids as compared to standard hybrids. It was concluded the hybrids containing the Bt Yield Guard gene reported slight corn borer damage and yielded over 51 bushels per acre more in the later planting as compared to the non-insect resistant hybrids. Grain sorghum received additional interest this past year due to drought tolerance and that it is a non-host for soybean cyst nematode. With improved management, verification trials demonstrated a yield improvement of 36 bushels per acre.

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 cow size while improving

weaning weights by 45 pounds, improving cow reproduction rates by 30 percent, improving total pounds of calf weaned per cow exposed by 197 pounds, reducing production cost by 41 percent and reducing the cost of growing replacement heifers without negatively affecting reproduction performance. County workshops, programs and popular press articles are methods used to transfer ABIP knowledge gained to other producers. Other beef cattle educational programs included Beef Quality Assurance, Feedout Program, Reducing Winter Feed Cost Focus Program, Genetic Selection (bulls and heifers) and Stocker Cattle Conference.

Extension dairy programs helped dairy producers and related industries identify areas to enhance production efficiency and compete in an increasingly competitive national milk market. Waste management, Dairy Herd Improvement Program and forage quality are just a few 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 Training and other horse care and management programs were delivered to over 2,400 horse owners last year.

Forages are the basis of a health livestock industry. Educational programs included grazing schools, musk thistle demonstrations, 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.). Helping a grower shift some rice acreage to field production of shade trees should yield $180,000 profit per year once the trees can be harvested.

Other important areas of Extension programming included chemical and pesticide handling, water quality, alternative agriculture and diversification, and new uses for agriculture products. Conducting programs to reduce chemical drift and applying chemicals more safely and more effectively are the primary goals of Extension. Application guidelines were developed and presented as an ongoing part of pesticide license recertification for all commercial and private applicators. Water quality programs are designed to address the local issues in a respected watershed, demonstrate best management practices to protect watersheds and to partnership with other agencies and organizations with water quality interests and responsibilities. Approximately 200 swine and poultry producers have lost their contracts and are looking for other ways to stay on the farm. Extension conducted educational programs and provided technical advice for alternative agriculture enterprises such as rabbit and worm production. Cotton gin trash is a problem for ginners. A composting method was developed by Extension to help ginners remove their gin waste at responsible cost ($10 to $15 per ton).

Youth education to teach lifetime skills continues to be a major emphasis in Extension. The educational tools used to teach these skills were livestock projects (beef cattle, dairy cattle, poultry, swine, sheep and horses), grassland stewardship, spatial technology (GPS, GIS, etc.), etc.

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

Total FTEs

Total Budgetary Amount

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 2002. These crops included tomatoes, melons, squash, peppers, sweet corn, sweet potatoes, cabbage, greens, spinach and southern peas. The acreage continues to increase as new growers come into the market and as new marketing opportunities appear. The heat and drought of 2002 adversely affected many crops. Growers using irrigation had successful and consistent production.

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

Marketing continues to be a challenge for all perishable horticultural crops, especially vegetables. A more concerted assistance, likely from the state level, with horticultural marketing would 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 grower to sell their crop. 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 is 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.

Extension Program Results and Accomplishments

Output Indicators

In efforts to meet the needs of clientele the following were implemented in 2002:

1,253 Number of educational publications, mass media, and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties.

432 Number of educational meetings, demonstrations, farm visits or field days held to educate commercial clientele and other interested parties.

18 Number of workshops on nutrition, production, and post harvest, marketing, and/or breeding and selection conducted to educate commercial clientele and other interested parties.

1,201 Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials.

3,893 Number of participants that examined new production technologies.

48 Number of commercial operations.

Outcome Indicators

1,500 Number of participants that reduced their chemical and fertilizer inputs.

Source of Funds

Smith Lever 3b and 3c

Scope of Impact

Dissemination – Educational publications, farm visits, field days and educational meetings and workshops were conducted across the state of Arkansas.

Scope of Program – Arkansas.

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 cost per unit of production 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 agri-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, but are not limited to, 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 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 will 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 2002:

Demonstrations:

9 Cotton Research Verification
18 Variety
10 Technology Challenge (Transgenic vs Conventional Varieties)
1 Plant Growth Regulators
1 In-furrow/Seed Treatment Protectants
3 Harvest Aid Timing
1 COTMAN – Whole Farm

Educational Meetings:

15 Production Meetings
2 Cotton Scout Trainings
13 IPM Meetings
7 Harvest Aid Meetings
13 Field Day/Crop Tours

Applied Research:

5 Plant Growth Regulators
3 Fertility
4 Harvest Aid

Outcome Indicators

- Arkansas will harvest 862 pounds of lint per acre from 930,000 acres for a total production of 1.65 million bales in 2002. Arkansas is consistently among the leaders in the Mid-South as well as the U.S. in lint per acre yields, trailing only Arizona and California for last year's crop and yields averaged over the last five years.

- Arkansas ranks fifth in production, producing just over 10 percent of the U.S. crop. Arkansas' cotton and cottonseed are generally valued at over $500 million annually.

- Arkansas produces about 1 million acres of cotton annually, while 12 to 16 million acres of cotton are grown nationally.

- 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. A trend observed since 1999 continues to occur with no-till cotton production acreage increasing by 50 percent each consecutive year. Convention till acreage has been reduced from 65 percent to 41 percent during this 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 termed tenderable or of sufficient quality to meet standards for delivery on New York No. 2 futures contract exceeds that of all other states in the Mid-South (Arkansas, Missouri, Mississippi, Tennessee and Louisiana). Although total production in Mississippi exceeded that of Arkansas by approximately 260,000 bales, Arkansas farmers produced over 145,000 more bales of tenderable cotton than did Mississippi. Arkansas was second only to Missouri 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. This program was implemented at nine locations in eight counties statewide this season. The CRVP coordinator also assisted with additional multiplier fields in which the county Extension agent supervises. This program offers an excellent means to transfer technology to producers as well as offer valuable hands-on training for county Extension agents. An integrated Research Verification Program was also conducted this year. This program allows the producer to experience long-term benefits associated with crop rotation and alternative tillage practices while participating in back to back multi-crop verification programs. This program is in its second year and will continue to expand.

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 $66,000, and "in kind" gifts totaled $74,000 for the cotton program.

Scope of Impact

Dissemination – Information is disseminated to any interested party through mail, Extension websites, personal communications, *Cotton Comments*, and by producer meetings, conferences and seminars.

Publications and Extension support materials developed include:

9 Extension Publications
3 Articles in Research Bulletins
3 Educational Materials
9 Individual Articles
9 Article Interviews
11 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, Philips, 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 Variety Demonstration

Variety selection is an important decision required for producing high cotton yield and quality. The Greene County agriculture advisory committee identifies cotton variety selection each year to be targeted by the Extension office. As a result of this program, cotton producers in Greene County chose consistently high yielding cotton varieties. An adapted cotton variety will many times yield 200 pounds more cotton per acre than a variety that is not adapted. At 50 cents per pound, that is an increase of $100 per acre in gross income. There are 20,826 acres of cotton in Greene County; this times the $100 per acre increase would result in an increase in gross income for the entire cotton acreage of Greene County by $2,082,600.

General Program Information – County variety demonstrations were implemented in 12 counties. The demonstrations are replicated and harvested

with the producers' picker. Seedcotton weights are collected in the field. Fiber samples are collected for HVI analysis. Yield and fiber quality results are posted on the website and are linked to the University Variety Testing Program results.

Locations – This success story highlights the Greene County program.

Impact Numbers – Planted acres in Greene County were 20,826 in 2002. Planted acres statewide were approximately 1.0 million acres, while 930,000 acres were harvested in 2002.

CES Section Contact Person: William C. "Bill" Robertson, Extension Agronomist - Cotton, 501-671-2186, wrobertson@uaex.edu

Cotton IPM Meetings

Woodruff County had approximately 46,000 acres of cotton in 2002. Farmers are faced with low commodity prices and higher production cost. Cotton farmers need to make every production dollar count.

Fourteen years ago, Woodruff County cotton farmers needed a way to get timely information on cotton production and interact with people knowledgeable in the crop in order to make better production management decisions. Since that time, the Woodruff County Extension Service has responded to that need by conducting summer Integrated Pest Management (IPM) meetings.

During the summer of 2002, seven IPM meetings were conducted in the Cotton Plant area of Woodruff County where the county's only cotton gin is located. Since time is a valuable commodity for a farmer during the summer months, the IPM meetings were held during the lunch hour with meals provided by agri-industry sponsors. An average of 15 cotton growers and industry fieldmen attended these meetings held under the gin shed.

Local cotton farmers are encouraged by Eugene Terhune, county Extension agent - staff chair, to openly ask questions about production in their farming operation. The farmers hear about the local crop situation as well as the cotton situation across Arkansas and the Mid-South. Growers also hear Extension specialist discuss timely topics, such as weed control, insect control, PGRs, fertility, irrigation, disease control and defoliation.

General Program Information – IPM meetings are held regularly at 11 locations statewide. These locations serve essentially all cotton producing counties in Arkansas. These meetings serve as an open forum between Extension and crop advisors and/or growers.

Location – This success story highlights the Woodruff County program in Central Arkansas.

Impact Numbers – Participants at these meetings often represent 40 percent to 70 percent of the acreage of an area. Word of mouth concerning timely reminders of Extension recommendations to other advisors provides broad reaching impacts and favorable attitudes of our program.

CES Section Contact Person: William C. "Bill" Robertson, Extension Agronomist - Cotton, 501-671-2186, wrobertson@uaex.edu

COTMAN

End-of-season decisions for cotton, including insecticide termination, are often hard to make and can be very costly if the wrong decision is made. Every year cotton farmers grapple with those decisions and hope that they exercised the correct option. The COTMAN program, and its component BOLLMAN, developed by the University of Arkansas, allows farmers to gather more information on which to base their end-of-season decisions. The purpose of the program is to signal farmers when cotton bolls are safe from damaging insects. At a certain point, as bolls mature, the outer wall hardens and does not allow insects to penetrate it, thus protecting the boll from damage. By collecting physiological data and daily high and low temperatures from a field, the program will predict the date that the bolls are safe from insects and spraying insecticides to protect the bolls is no longer needed. Spraying after that point is a waste of money.

General Program Information – COTMAN is a computerized program developed in Arkansas to assist in cotton management. The end-of-season component, which utilizes the NAWF concept to identify the last effective boll population, is the new basis used for crop termination not only in Arkansas, but for many cotton-growing regions across the country.

Location – This success story highlights the Lincoln County program located in Southeast Arkansas.

Impact Numbers – In 2002, growers in Lincoln County saved $40.00 per acre in insecticide costs compared to surrounding fields, with no adverse affect on yield. It is estimated that this concept of insecticide termination is implemented on over 75 percent of the acreage statewide.

CES Section Contact Person: William C. "Bill" Robertson, Extension Agronomist - Cotton, 501-671-2186, wrobertson@uaex.edu

Preserving Quality

Steve Stevens, a producer in Desha County, relayed to Extension that efforts to follow harvest aid timing based on heat unit accumulation beyond cutout was very successful in 2002. On his 2,500-acre farm, harvest aid programs were implemented at 850 heat units beyond cutout as indicated with the COTMAN program on all but two of his fields. These two fields were defoliated using his traditional approach of 1,000 to 1,050 heat units beyond cutout. Discounts associated with high micronaire were observed only on these two fields. Discounts associated with high micronaire can range from 3 to 6 cents per pound. This can range from $50 to $75 per acre in severe instances.

General Program Information – COTMAN is a computerized program developed in Arkansas to assist in cotton management. The end-of-season component, which utilizes the NAWF concept to identify the last effective boll population, is the new basis for crop termination not only in Arkansas, but for many cotton-growing regions across the country.

Location – This success story highlights the Desha County program in Southeast Arkansas.

Impact Numbers – The use of this program is instrumental in helping preserve the quality of the crop. Arkansas producers brought to market more bales of tenderable cotton than any other state in the Mid-South (Arkansas, Missouri, Mississippi, Tennessee and Louisiana).

CES Section Contact Person: William C. "Bill" Robertson, Extension Agronomist - Cotton, 501-671-2186, wrobertson@uaex.edu

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

Contact: Gary Huitink, 501-671-2237, Biological and Agricultural Engineering

Situation

Soybeans and wheat have generated little profit recently for many growers, and in some cases soybeans have been produced at a loss in Arkansas. Direct-seeded or no-tillage soybeans, wheat, 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 on appropriate drainage and equipment that are required for successful grain yields. These criteria are essential to economically produce grain and cotton crops in Arkansas using no-tillage.

Stakeholder Input

Arkansas and Mid-South growers are asking for equipment and crop production guidelines to produce crops with equal yield using direct-seeding. These needs are becoming more specific as the

TMDL criteria are identified for specific watersheds. If "best management plans" are implemented for cropped land, more research and technical data are needed than is necessary 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 may include specific engineering input to implement the reduced or no-tillage appropriate for a soil or part of a field.

Overview

Consulting and education on adequate drainage, reduced preplant 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, grain sorghum, soybeans and wheat production. More research applied to typical soils in Arkansas and adapting the recommendations to growers' fields is needed. Consultation, field days, demonstrations and meetings showed growers practical techniques.

Extension Program Results and Accomplishments

Output Indicators

- Cooperative Extension Service partnered with Cotton Branch Experiment Station and Pine Tree Experiment Station and host farmers to conduct an "Innovative Technology Tour" on July 18 and 19, 2002.
- Replicated experiments at Pine Tree Experiment Station, Cotton Branch Experiment Station, Byron Orweiler farm and Tony Wilkie farm were conducted with cotton, corn, grain sorghum and soybeans.
- *Planting Reduced-Tillage Soybeans* fact sheet was updated and distributed in 2002.

Outcome Indicators

- No-tillage corn on the Byron Orweiler farm produced 140.8 and 155.6 bu/A on a replicated experiment. Similar yields were produced on the Pine Tree Experiment Station by improving drainage, seeding on beds and direct-seeding. Growers are inquiring about the equipment and management requirements and how to maintain yields while reducing the time and fuel per acre to produce a crop. County agents, consultants, growers and others are using these data and recommendations.
- An estimated two-thirds of the wheat crop and one-third of the soybean crop were direct-seeded (no-tillage).
- A significant portion of the cotton and soybean crops were seeded as "stale seedbed" in 2002.

  Pioneering growers were direct seeding corn, cotton and grain sorghum this past year.
- Estimated that 1 million acres are subsoiled annually in Arkansas, when fall weather allows.

Source of Funds

Smith-Lever, Arkansas Wheat Promotion Board

Scope of Impact

Dissemination – County agent and grower training and consultation were provided as requested. The "Innovative Technology Tour" on July 18 and 19, 2002, and other programs have provided information. Subsoiling developments pioneered in Arkansas are imitated in educational efforts in Louisiana, Mississippi, Missouri and Tennessee. University of Arkansas Cooperative Extension Service guidelines are available in print and are also published on the Cooperative Extension Service web site.

Scope of Program

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 our on-farm replicated studies and subsequent education.

Program Response: Extension Soybean Educational and Applied Research Program

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

Situation

In 2002, producers planted 2.95 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 2002 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 2001 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 – Each year over 200 different varieties are 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.

Fertility and Soil Management – We continue to find fertility issues each year. 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 2002:

Demonstrations:

23 Soybean Research Verification Program
10 Variety

Educational Meetings:

1 Arkansas Soybean Research Conf.
20 Production Meetings
13 Field Day/Crop Tours

Outcome Indicators

– In 2002, Arkansas harvested 2.9 million acres of soybeans with an average yield of 34 bushels per acre. This average ties the record set in 1994. Arkansas ranks ninth nationally in soybean production and soybeans are produced in 42 counties in Arkansas. Only 60 percent of the soybean acreage in 2002 was irrigated and 76 percent of the acreage was produced using transgenic soybeans.

– The 2002 Arkansas Soybean Research Verification Program (SRVP) consisted of 23 commercial soybean fields. The Early Season (ESPS), Full Season (FSSPS) and Doublecrop (DCSPS) production systems were utilized in the 2002 SRVP. All three production systems were represented within the irrigated environment, but the FSSPS was not 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 June. 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 12 irrigated FSSPS fields was 51 bushels per acre, the two irrigated DCSPS fields were both Precision Ag fields and final yield analyses are not determined at this time. The two irrigated ESPS fields averaged 58 bushels per acre. In the non-irrigated environment, the DCSPS field produced an average yield of 49 bushels per acre, and the five ESPS fields averaged 37 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 $200,000 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 mail, Extension websites, personal communications and by producer meetings, conferences and seminars. Publications and Extension support materials developed include:

3 Extension Publications
3 Educational Materials
10 Article Interviews
10 Television and Radio Interviews

Scope of Program – Over 50 of the 75 counties 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.

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

In 2002, agricultural producers of eastern Arkansas faced the challenge of learning provisions associated with the new 2002 Farm Bill. For the first in many years, producers have been given the option of updating farm program acres and yields. The Farm Bill also requires 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:

- Irrigation cost estimates.
- Increasing farm profitability.
- Economic analysis of transgenic cotton varieties.
- Economic analysis of ultra narrow 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 – Passage of the 2002 Farm Bill has increased the need for commodity marketing skills. Protection against declining government support payments is now important as well as protecting against low prices.

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. Market information is also presented at the annual tomato symposium and field day.

Price Risk Management – Numerous seminars 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.

- Analyzing the consequences of public policy issues on farm firm systems and infrastructure.
- Studying the impact of globalization on farm firm systems and infrastructure.
- Identifying alternative policy, management and/or resource development strategies for enhancing farm firm systems and infrastructure profitability and economic viability.

In FY 2002, Extension policy specialists analyzed impacts of the new farm bill, provided agricultural policy information to clientele through the web, print media and radio, provided decision aids for analyzing update options and participated in national policy conferences.

Horticulture Economics

Fruit Enterprise Budgets – Developed a preliminary plasticulture strawberry enterprise budget for the state's producers to utilize. The information was presented at the annual meeting of Arkansas Strawberry Growers Association. Also provided information for strawberry producers in the areas of cost analysis, pricing and marketing approaches.

Survey of Arkansas Horticulture Industry – This statewide project assesses the economic contribution of the state's horticulture industry. The project is querying over 4,000 of the state's horticultural producers and businesses about current conditions and trends, business practices and obstacles for their industry. The survey examines 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. Extension was awarded a competitive grant from the Arkansas State Plant Board to partially fund the cost of the project. In addition, industry groups and stakeholders — U of A horticulture department, Arkansas Green Industry, Arkansas Turf Growers Association and Arkansas Farm Bureau – supported the project financially. Extension collaborated with Arkansas Agricultural Statistic Service to conduct the survey. Final Arkansas industry reports projected to be completed by July 2003.

Marketing Horticultural Products – A marketing program was conducted at two Extension regional training events and a statewide University of Arkansas at Pine Bluff conference on specific strategies for marketing horticultural products. The focus of those programs examines food marketing costs and the changes in producer marketing margins, value added benefits and direct marketing options.

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, irrigation cost information, marketing costs, direct marketing options and business structure information. This information includes articles on the importance of farmers' markets, business structure of cooperatives and utilizing enterprise budgets for business planning. Extension relies on external sources for a number of different horticulture enterprise budgets, but the department has recently developed a program that will result in the release of a series of budgets for the state's producers beginning in the spring of 2003.

Extension Program Results and Accomplishments

Output Indicators

91	Number of educational meetings held in which management, marketing and/or farm policy information was presented.
3,906	Number of participants attending educational meetings and receiving educational materialsrelated to management, marketing, and farm policy.
732	Number of educational materials produced.

Outcome Indicators

1,381 Number of producers that implemented changes in management practices as a result of farm management educational efforts.

870 Number of producers that implemented changes in management practices as a result of commodity and livestock marketing educational efforts.

734 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 – This programs have been delivered at some level in all 75 Arkansas counties.

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. 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. County Extension Councils and other advisory groups in the row crop producing counties recommend that Extension address this issue. 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

32 Educational meetings, tours, field days and workshops where information on irrigation scheduling was presented.

30 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 300 farms and/or producers using irrigation scheduling program.

– 35 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 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: Multiple Inlet Rice Irrigation

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

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 row crop 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 a potential average water and energy savings of 25 percent and an average labor savings of approximately 30 percent. Field experiences also indicate that MIRI fields can be flooded quicker, which improves fertilizer and herbicide efficiency. 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

40 Educational meetings, tours, field days and workshops where information on MIRI was presented.

– County Extension offices emphasizing MIRI in their educational efforts.

20 Counties with MIRI field demonstrations.

45 Producers involved in MIRI field demonstrations.

38 MIRI field demonstrations.

Outcome Indicators

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

Five rice producers cooperated with Extension to conduct field comparison studies on MIRI during the 2002 season. Following are the farms, the counties and the results.

- Fogleman Farm, Crittenden County – used 2 percent less water from midseason (early season differences not available due to inaccurate meter readings) on MIRI field with clay soil.
- Marconi Farm, Crittenden County – used 9 percent less water with MIRI on sandy loam soil.
- Henry Farm, Desha County– used 26 percent less water with MIRI on field with silt loam soil.
- Craig Farm, Poinsett County – used 44 percent and 42 percent less water on two MIRI fields with clay soil.
- Hutchison Farm, Poinsett County – used 17 percent less water with MIRI 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, Woodruff.

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. Consequently, there is a need to fine-tune and, if needed, modify existing fertilizer recommendations, so that Arkansas producers are able to maximize the yield potential of all commodities. Each year Arkansas growers are faced with production issues that have the potential to negatively affect their expected yields. Of particular significance was a boron deficiency that affected several soybean fields in Cross, Woodruff, Poinsett and Greene counties during the 2002 season, with some growers experiencing losses of up to 50 percent of their typical yields.

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

Soil Testing and Fertilizer Recommendations

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, with this service offered free of charge to Arkansas residents through fertilizer tonnage fees. Fertilizer recommendations are included with the majority of the soil test reports. The Extension soils program provides technical support on issues regarding soil testing and fertilizer recommendations to county agents, producers, homeowners, consultants and other Extension specialists via in-service trainings, productions meetings, individual contacts and telephone calls.

Applied Soils and Plant Nutrition Research

Rice, soybeans and cotton are the major row crops in Arkansas. However, there is a renewed interest in corn and grain sorghum due to these crops' rotational benefits, increasing yield potentials and new market opportunities. There is a need to fine-tune and, if needed, modify existing fertilizer recommendations for both crops, so that Arkansas producers can maximize the yield potential of recently developed hybrids. Studies to assess the response of grain sorghum to varying nitrogen rates under irrigated and non-irrigated conditions were initiated in 2002 and will continue through the 2004 season.

A boron deficiency was first documented two years ago in some soybean production regions in Arkansas. Boron deficient fields were again identified during the 2002 season and, as in the previous season, they tended to be localized in counties north of I-40, west of Crowley's Ridge, especially Cross, Woodruff, Poinsett and Greene counties. It was estimated that nearly 5,000 acres were severely affected by this problem. Studies were initiated in 2002 to better understand the response of soybeans to boron fertilization, with such efforts being conducted in growers' fields affected by this malady.

Extension Program Results and Accomplishments

Output Indicators

5	Demonstration/research tests.
6	Field days/tours.
2	Training sessions for consultants.
12	Educational meetings.
952	Number of individuals attending educational programs on fertilizer use and plant nutrition.
100,000	Number of soil samples submitted to the soil test lab in Marianna.
10,748	Number of individual analytes determined for diagnostic purposes.

Outcome Indicators

1.4 million	The number of acres provided with University of Arkansas' fertilizer recommendations.
718	The number of soil and plant samples received for diagnostic purposes and provided with suggested corrective measures.
20	The number of soybean bushels per acre saved by following University of Arkansas boron recommendations in fields affected by a boron deficiency.

Source of Funds

Funds were obtained from the Soil Test and Research Board, the Corn and Grain Sorghum Promotion Board and gifts from private companies.

Scope of Impact

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

2 Popular press, interviews.
1 Update Soil Test Guide.

Scope of Program – Cross, Lee, St. Francis, Craighead, Jackson, Ouachita and Woodruff counties.

Description of Outcomes (Impact Data) – It is estimated that nearly 5000 soybeans acres were affected by a severe boron deficiency during the 2001 season, with affected fields producing only half of their typical yields. Such yield loss potential could be in the order of 100,000 bushels. Preliminary information suggests that recommended fertilization practices for boron should reduce the yield loss potential associated with this malady.

Program Response: Technology Transfer and Applied Research in Feed Grains

Contact: W. Jeremy Ross, Area Extension Agronomist - Corn and Grain Sorghum, 501-671-2148, jross@uaex.edu; Dr. Leo Espinoza, Extension Agronomist - Soil, 501-671-2168, lespinoza@uaex.edu

Situation

Feed grain crops include wheat, corn and grain sorghum. These crops were planted on 1.47 million acres in 2002. Wheat planted on 960,000 acres averaged 46 bushels per acre. Corn and grain sorghum increased in acreage from 2001. Grain sorghum acres will likely continue to increase in 2003 due to an increasing nematode population in soils historically planted in cotton and soybean. Corn acres will likely increase from 270,000 acres to over 400,000 acres. These additional acres will come at the expense of cotton and rice. With the demand for corn to feed the 1.3 billion broilers in Arkansas and positive basis at deliver points, corn is becoming a commodity that farmers can cash flow. Corn and grain sorghum received timely rains combined with favorable temperatures, resulting in outstanding yields. Educational programs addressing hybrid selection, soil fertility requirements and irrigation timing were very important in obtaining good yields in 2002.

Stakeholder Input

In many instances County Agriculture Councils planned educational programs consisting of demonstrations, participated in the Wheat Research Verification Program and Corn and Grain Sorghum Verification Programs, conducted educational meetings, etc., to address the long-term sustainability of corn, grain sorghum and wheat production. In addition, Extension was called upon to deal with emerging issues of 2002 that were unforeseen and had to be dealt with through impromptu educational programming as the crop season progressed.

Overview

Wheat

Arkansas wheat farmers harvested 840,000 acres of wheat, averaging 46 bushels per acre in 2002. Wet weather, combined with colder than normal conditions during February and March, resulted in over 120,000 acres of wheat abandoned. Test weights were high during harvest and discounts for test weights were relatively low. The Wheat Quality Tour visited Arkansas in early May. The tour consisted of a grain buyer, processors and a national journalist reporting on crop quality and conditions from Arkansas to Michigan.

The Wheat Research Verification Program (WRVP) included 14 fields in 2002. The fields were located throughout the state. Fields enrolled in the WRVP averaged 63 bushels per acre. 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 grown in rotation with rice, N management on clay soils and disease control.

Five wheat variety demonstrations were conducted in 2002, and these locations were used in countywide field days to emphasize newly released varieties with superior test weight, disease resistance and yield. Ninety-two wheat varieties were screened for tolerance to Sencor (metribuzin) at the Rice Research and Extension Center. The

information obtained from the herbicide screening was used in the Wheat Update publication on variety selection. Twenty widely adapted wheat cultivars were used to determine optimum nitrogen rates. These nitrogen plots were following grain sorghum, rice, irrigated soybean and non-irrigated soybean crops. Paired plots comparing the fungicide Quadris and the herbicide Sencor (metribuzin) were conducted on the same 20 wheat cultivars used in the nitrogen tests. These studies were conducted at the Cotton Branch Station, Pine Tree Station and the Rice Research and Extension Center.

Corn

Arkansas farmers shelled 260,000 acres of corn in 2002 with an average yield of 134 bushels per acre. The Corn and Grain Sorghum Research Verification Program was conducted on ten fields. The average yield was 161 bushels per acre. A study was conducted at the Cotton Branch Station to evaluate the new genetically modified technologies in corn hybrids as compared to the standard hybrids. Several Bt corn hybrids were tested, and these hybrids were marketed as resistant to corn borer. The corn study was planted in April, May and June to evaluate borer damage to corn. From this study, the hybrids containing the Bt Yield Guard gene reported slight corn borer damage. These results showed a possible breakdown of resistance of the southwestern corn borer to the Bt gene. Additionally, the Bt hybrids yielded over 51 bushels per acre more in the later planting as compared to the non-insect resistant hybrids.

Five corn hybrid demonstrations were implemented to illustrate growth characteristics, irrigation timing and yield. Corn borer moth traps were located at five producer fields to help monitor and implement control measures. In addition, these locations also contained weather-monitoring stations that supplied critical data to the irrigation-scheduling program that was used in the corn verification fields.

Grain Sorghum

Arkansas grain sorghum producers harvested 240,000 acres with a projected yield of 77 bushels per acre. Three Grain Sorghum Research Verification Fields were established in 2002. The fields averaged 113 bushels per acre. Throughout Arkansas, grain sorghum received renewed interest in production due to its drought tolerance and the fact that it is a non-host plant for soybean cyst nematode. In 2003, grain sorghum planted acres will most likely increase due to the aforementioned factors.

5 grain sorghum hybrid demonstration plots were established. Additional weed control work was accomplished to evaluate the control of broadleaf signalgrass.

6 area-wide production meetings were conducted for grain sorghum production, and additional educational meetings are being considered for 2003.

Extension Program Results and Accomplishments

Output Indicators

1	Wheat Quality Tour conducted in Arkansas in May.
14	Fields enrolled in the Wheat Research Verification Program (WRVP).
5	Field days and wheat variety demonstrations conducted on WRVP fields.
92	Wheat varieties screened for tolerance to Sencor (metribuzin) at the Rice Research and Extension Center.
1	Wheat Update publication on variety selection.
1	Corn Update publication on hybrid selection.
1	Grain Sorghum Update publication on hybrid selection.
10	Corn fields enrolled in the Corn and Grain Sorghum Verification Program (CGSRVP).
3	Grain sorghum fields enrolled in the CGSRVP.

3,000 Phone calls addressing feed grain production questions from clientele.

400 Field calls to individual growers.

50 Presentations at grower meetings and field days.

15 Field days.

20 Popular press articles or interviews.

3 Consultant training sessions.

15 Newsletters on crop production.

63 Average bushels per acre of wheat enrolled in the WRVP.

134 Average bushels per acre of corn enrolled in the CGSRVP.

77 Average bushels per acre of grain sorghum enrolled in the CGSRVP.

Outcome Indicators

20 Increased corn yield (bushels per acre) by applying nitrogen prior to tassel emergence.

50 Increased corn yield (bushels per acre) by using Bt expressed corn hybrids when planning dates after May 15.

25 Increased corn yield (bushels per acre) by educating producers on irrigation scheduling computer program.

Source of Funds

Funding was provided by the Arkansas Wheat Promotion Board, Corn and Grain Sorghum Promotion Board, gifts (various crop protection companies and seed suppliers) and Extension (Smith-Lever).

Scope of Impact

Dissemination – Newsletters are distributed weekly to update clientele on crop status and any concerns. Crop performance information collected from yield trials is distributed yearly. Promotion Board reports are also made available.

Scope of Program – State specific: 20 counties (Ashley, Clay, Conway, Craighead, Crittenden, Cross, Jackson, Jefferson, Johnson, Lafayette, Lawrence, Lee, Lincoln, Logan, Monroe, Poinsett, Prairie, St. Francis, Pulaski and Yell)

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 2002, rice was grown on 1.503 million acres in Arkansas, representing 47 percent of all U.S. rice production, with an average yield of 6,440 pounds per acre (143 bushels per acre). This resulted in Arkansas continuing to lead in rice production in the U.S. Arkansas rice producers face many challenges in order to produce a profitable crop and maintain sustainability of the land. The most significant issues include:

Variety Selection – 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.

Groundwater 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.

Integrated Pest Management – New technology is near release for controlling red rice, the number one

weed problem in Arkansas rice fields, directly in the rice crop.

– Grape colaspis larvae caused a significant amount of stand loss in the 2002 Arkansas rice crop resulting in re-planting of several thousand acres.

– Rice disease problems, particularly sheath blight, panicle blight and rice blast, continue to be a problem, causing yield and quality reductions.

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.

– Effective zinc fertilization continues to be a problem in Arkansas with the use of seed treatments.

– The need for an appropriate soil test procedure for estimating P fertilizer requirements continue to be an issue.

Stakeholder Input

County educational meetings are planned based on input from county councils, made up 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 interests of the producers for each county.

Overview

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 turnrow 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 website in 2002, allowing growers to review information at any time from their homes.

A summary of county Extension programs during the 2001-2002 year showed that in excess of 8,654 growers received information from county grower meetings, field days and Extension publications/newsletters.

In 2002, rice was grown on 1.5 million acres with an estimated average yield of 6,450 pounds per acre (143 bushels per acre). Rice acreage decreased nearly 7 percent from the 2001 acreage but was still among the top five in harvested rice acreage in Arkansas. The estimated 2002 state average yield is the highest average yield on record, which is a remarkable accomplishment considering the unusually cool spring and the associated pest problems encountered during 2002. However, the record yields can be attributed to improved varieties, improved management practices and favorable weather during critical times during the growing season.

The 2002 DD50 rice management computer program was used by 1,809 growers for 10,468 rice fields totaling 716,567 acres. The DD50 program was updated to include information for five new varieties and was updated to include several new research based recommendations concerning fertilization and disease control to growers. The DD50 now supports 53 varieties, 27 management decisions, and includes disease susceptibility ratings for each rice variety. For the first time in its history, the program was converted to a web-based program in 2002 to allow producers direct access at their convenience. Wells, a cultivar released by the University of Arkansas Agricultural Experiment Station, was grown on 42 percent of the state's acreage. Fifty-two percent of the Arkansas rice acreage was seeded in varieties developed by the University of Arkansas, including Drew (5 percent), LaGrue (4 percent), Ahrent (2.5 percent), Francis (0.2 percent) and Kaybonnet (0.1 percent). Other varieties supported by the DD50

program that were grown in Arkansas, including the percentage of the 2002 rice acreage, were Bengal (10 percent), Cypress (4 percent), Cocodrie (30 percent) and new Clearfield varieties (1.5 percent). Applied research was conducted on new conventional varieties and experimental lines with herbicide resistance technology (Clearfield) to develop DD50 thresholds for the 2002 DD50 program and University recommendations for production practices. The RICESEED computer program was updated in 2002 to include new varieties, updated seed weights, and can now be run from the Internet.

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 nine counties. Multiplier fields were also conducted by agents in several counties, involving several producers. Yields in the Rice Verification Program averaged 168 bushels per acre in 2002, approximately 25 bushels better than the statewide average of 143 bushels per acre. Net income for these fields averaged $38 per acre.

Extension Program Results and Accomplishments

Output Indicators

7,423 Number of producers attending educational programs (including Extension-related industry meetings), field days, etc., and receiving educational materials.

2,498 Number of educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on variety selection for increased yields and reduced production expenses.

2,598 Number of educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on fertilizer and soil and water management for increased yields and reduced production expenses.

2,923 Number of educational meetings, demonstrations/on-farm research, farm visits and/or field days for clientele on cultural and integrated pest management practices for increased yields and reduced production expenses.

1,231 Number of educational materials produced.

Outcome Indicators

3,281 The number of clientele who selected improved varieties.

52 The percent of acreage in Arkansas planted to varieties produced at the University of Arkansas.

3,049 The number of rice producers, consultants and industry representatives using soil, plant and water testing for rice.

858,839 The number of rice acres impacted by soil, plant and water testing.

2,505 The number of participants who utilize integrated pest management programs.

1,809 The number of clientele who utilize the DD50 program for improved production efficiency.

10,468 The number of fields enrolled in the DD50 management program.

716,567 The number of acres utilizing the DD50 management program.

109 The number of producers participating in the Arkansas Rice Research Verification Program and associated multiplier fields.

Source of Funds

Smith Lever 3b and 3c; Rice Grower Check-off Funds Administered by the Arkansas Rice Research and Promotion Board; Integrated Pest Management Funds

Scope of Impact

Dissemination – Statewide availability of program to interested counties. Information is available through printed publications or the UAEX web site.

Scope of Program – Education meetings were held in 35 counties in Arkansas where rice is produced. Information was also disseminated to consultants and other industry personnel at six regional meetings.

Programs of Excellence

Scouting Equals Success

Each week, during the growing season, the county agent in charge of the program, the program coordinator and the cooperator scout the field for any possible problems and discuss any practice that needs to be done. Face to face discussion with the cooperator while in the field is an unique quality of the program in that it allows the cooperator to see what the problem is or why a certain practice needs to be done. In years prior to enrolling in the Rice Research Verification Program, Mr. Johnny McGraw had been averaging approximately 140 bushels per acre yield on his rice in the field enrolled in the program. By following all of Extension's recommendations, he averaged 162 bushels per acre on his 40 acre field enrolled in the program in 2002. As would be expected, Mr. McGraw has expressed great satisfaction with the program and wants to participate again in the future.

With a 22 bushel per acre increase in yield and a price of $2.98 per bushel for rice (loan price), the program allowed for Mr. McGraw to add $65.56 in gross profits per acre for 2002 just from increased yield. In addition, Mr. McGraw saved $25.00 per acre in weed control costs as a result of enrolling in the program. Based on what he had done in the past, Mr. McGraw expressed that he would have treated the field with a postemergence herbicide for grass although treatment thresholds for grass control, based on University of Arkansas research, were never reached. Combining the total effects of increased yield and reduced weed control costs, Mr. McGraw added $90.56 per acre profit to his rice acreage enrolled in the program.

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 a 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.

Number of Counties Involved – 9 counties, including Arkansas, Crittenden, Cross, Desha, Lafayette, Lincoln, Mississippi, Prairie and St. Francis.

Impact Numbers – Yields across the fields enrolled in the program ranged from 11 to 47 bushels
per acre better than the state average of 143 bushels per acre, indicating that under recommended practices, the program can improve productivity. Even with the low prices, most of these fields showed a positive net return, with as much as $100 per acre.

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

KEY THEME: ANIMAL PRODUCTION EFFICIENCY

Program Response: Arkansas Beef Improvement Program

Contact: Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu, and Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu

Situation

Approximately 30,000 farms in Arkansas produce beef cattle. The average herd size is 30 head, with 80 percent of the farms having less than 50 head. About 97 percent of the beef cattle farms are family owned and operated. There are 1.8 million cows and calves with total cash value over $432 million. The total economic impact of the Arkansas beef cattle industry is over $1.4 billion.

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 agri-industry 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.

- In 1997, the original ten farms completed their five-year commitment to the program. These farms were replaced with four new farms. Three of the four farms completed their five-year commitment in 2002. In 2002, two farms were added to the five-year program. In addition to the new farms, 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, pasture renovation, white clover management, preconditioning calf value, replacement heifers and cull cow management and marketing. Fourteen farm families are currently participating in ABIP whole farm or project area.

- Six county-level ABIP workshops were conducted. 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 15 to 25 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 four 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 improve the credibility and image of the Cooperative Extension Service.

Extension Program Results and Accomplishments

Output Indicators

200 Number of producers attending ABIP field days.

120 Number of producers attending ABIP workshops.

10,000 Number of producers reading the ABIP articles in *Arkansas Cattle Business*.

Outcome Indicators

- During 2001-2002, the three ABIP whole farm demonstrations completed their five-year commitment. One producer reduced the average size of his cows and increased weaning weights by 45 pounds. The mature cow reproduction rate increased by 30 percent, and the total pounds of calf weaned per cow exposed increased 197 pounds. The second producer improved hay quality to the point that additional protein or TDN supplementation was not required. Cow efficiency improved by 6.6 percent, and bermudagrass stands improved due to better soil nutrient management. The third whole farm producer improved weaning weights (24 pounds) and used stockpiled fescue to reduce the need of harvested hay by 83 percent.

- The Logan County farm is in their fourth ABIP whole farm demonstration year. They continue to improve hay quality (protein and TDN). Cost of beef cattle production was reduced 41 percent, and this past year (2002), the ranch sold its first purebred bull calf crop. New farms in Madison and Nevada counties were added in 2002. Benchmark data including soil test, forage test, cattle performance, budgets, etc., is being collected.

- The ABIP special projects are also making a difference. The breeding and calving season project has three farms enrolled. Breeding and calving seasons are being reduced, and production efficiency continues to rise. The cow herd performance projects are completed. Weaning weights and cattle genetics improved on all farms. The replacement heifer project demonstrated savings of $77.50 and $60 per heifer on two Benton County farms without causing any reduction in reproduction performance. The same story could be said of the White and Polk County demonstrations. Heifers were bred at an earlier age with excellent results. A new farm in Boone County was added to the cull cow management special project. Two new projects were added in 2002: white clover management (nine counties) and value of calf preconditioning (five counties).

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 – Pope, Johnson, Benton, Polk, Dallas, Union, Saline, Logan, Saline, Sevier, Yell, Perry, Conway, Franklin, White, Howard, Nevada, Madison, Faulkner, Crawford, Sebastian, Izard, Lawrence, Searcy, Washington and St. Francis counties.

Programs of Excellence

ABIP Whole Farm Demonstration

Through the implementation of cost-effective beef cattle and forage management practices, the following ABIP Whole Farm Demonstrations have improved beef cattle production efficiency.

General Program Information – The objective of the ABIP Whole Farm Demonstrations is to gain and transfer knowledge concerning beef cattle and management systems to enhance the efficiency and profitability of Arkansas cattle producers. Setting goals, evaluating resources and selecting the management practices that will help the cattle producer achieve those goals are accomplishing this.

Number of Counties Involved – 4

Impact Numbers

Saline County:
- Increased weaning weighs by 45 pounds.
- Improved intramuscular fat and ribeye area for enhanced carcass quality.
- Increased mature cow reproduction rate by 30%.
- Increased gross income by 25% and total pounds of calf weaned per cow exposed by 197 pounds.

Johnson County:
- Improved hay quality that resulted in eliminating the need for additional supplemental feeding.
- Improved cow efficiency by 6.6%.
- Improved soil fertility to strengthen bermudagrass stands and production.
- Improved the percentage of steers grading Choice from 20% to 70%.

Pope County:
- Improved weaning weight efficiency from 43% to 47%.
- Improved weaning weights by 24 pounds.
- Used winter annuals and stockpiled forages to greatly reduce the need for feeding hay.

Logan County
- Improved hay quality from 12.8% to 13.9% crude protein and 56.8% to 61.0% TDN.
- Reduced cow cost by 41%

CES Section Contact Person: Ron Matlock, Saline County Extension Agent, 501-303-5672, matlock@uaex.edu; Blair Griffin, Johnson County Extension Agent, 479-754-2240, bgriffin@uaex.edu; John Payne, Johnson County Extension Agent, 479-968-7098, jpayne@uaex.edu; Larry Campbell, Logan County Extension Agent, 479-963-2360, lcampbell@uaex.edu; Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; and Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu

ABIP Breeding and Calving Season Project

To demonstrate the beef cattle management changes necessary to shorten the beef cattle breeding and calving seasons.

General Program Information – To 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 of Counties Involved – 2

Impact Numbers

Union County:
- The breeding season has been reduced from approximately 240 days to 90 days in three years.
- Budgets from the first two years of the transition showed a reduction in beef cattle cost of 22% and an improvement in gross margin per animal unit of 54%.

Dallas County
- In the first year of the project only 54% of the cows calved in the desired calving season, but in the fourth year of the project 100% of the calves calved in the desired calving season.
- Cost per animal unit decreased by 26% and, along with increase in cattle production, decreased break-even cost by 46%.

CES Section Contact Person: Gerald Crossland, Union County Extension Agent, 501-864-1916, gcrossland@uaex.edu; James Hall, Dallas County Extension Agent, 870-352-3505, bhall@uaex.edu; Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; and Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu

ABIP Cow Herd Performance Project

To demonstrate how cow-calf production records can be used to improve the herd genetically.

General Program Information – Cow Herd Performance Testing is one of the best management tools available for increasing the performance and production of the cow herd. This program was

designed to secure performance information and to demonstrate how to use the information to make culling and replacement decisions.

Number of Counties Involved – 2

Impact Numbers

St. Francis County:
- The top one-third of the cows improved 205-day weaning weights from 448 to 572 pounds.
- The bottom one-third of the cows improved 205-day weaning weights from 385 to 449 pounds.

Sevier County:
- The 205-day weaning weights of steers from the fall calving herd increased by 24 pounds.
- Cow cost was reduced by 38% over a two-year period.
- The top one-third of the cows improved 205-day weaning weights from 550 to 587 pounds, and the bottom one-third of the cows improved 205-day weaning weights from 439 to 483 pounds.

CES Section Contact Person: Kevin Norton, St. Francis County Extension Agent, 870-261-1730, knorton@uaex.edu; Ralph Tyler, Sevier County Extension Agent, 870-584-3013, rtyler@uaex.edu; Dr. Jane Parish, Animal Science Section, 501-671-2162, jparish@uaex.edu; and Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu.

ABIP Producer Workshop

The ABIP Producer Workshop communicates the knowledge gained from the ABIP demonstrations. The workshops have proven to be an excellent educational method to transfer this knowledge to producers on a larger scale.

General Program Information – As a result of ABIP demonstrations, a producer workshop was developed to transfer ABIP knowledge gained. The workshop addresses cow-calf budgets, forage testing, supplemental feeding, mineral supplementation, cow herd performance, forage production planning, grazing systems, controlled breeding seasons and timing of management practices. It consists of two evenings of two and a half hours per evening.

Number of Counties Involved – 6

Impact Numbers – **Thirty-one producers attended the first night of the workshop and 29 producers attended the second night. County agents' contacts made at the program provided opportunities for follow-up visits. The educational materials covered at the workshop were very appropriate for the producer audience. Results from a survey conducted at the workshop showed that a majority of the producers plan to implement management tools that were taught at the workshop**

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Program Response: Beef Cattle Management

Contact: Dr. Tom R. Troxel, Animal Science Section, 501-671-2188, ttroxel@uaex.edu; Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu; Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu; Dr. Jane Parish, Animal Science Section, 201-671-2162, jparish@uaex.edu; and Doug Kratz, Animal Science Section, 501-671-2179, dkratz@uaex.edu

Situation

Approximately 30,000 farms in Arkansas produce beef cattle. The average herd size is 30 head, with 80 percent of the farms having less than 50 head. About 97 percent of the beef cattle farms are family owned and operated. There are 1.8 million cows and calves with total cash value over $432 million. The

total economic impact of the Arkansas beef cattle industry is over $1.4 billion.

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 agri-industry 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 Animal Science Section has a number of programs that address beef cattle management education. They include Arkansas Beef Quality Assurance Program, Arkansas Feedout Program, Reducing Winter Feed Cost Focus Program, Cow Herd Performance Testing Program, On Farm Bull Testing Program, Arkansas Cattle Growers' Conference and Livestock Market News.

- 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). The National Cattlemen's Beef Association estimated that cattle industry loss due to misused cow-calf management practices was $27.26 per calf. As of fall 2002, 1,921 Arkansas beef cattle producers have enrolled in the BQA program. That is a possible savings of over $1.3 million to the Arkansas beef cattle industry. Because of BQA educational efforts in Arkansas and around the nation, injection-site lesions in the top butt or top sirloin have been reduced from 22.3 percent in 1991 to less than 2.0 percent in 2002.

- The Arkansas 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 be competitive in beef production.

  Three hundred and fifty calves from 37 Arkansas producers representing 18 counties were placed on feed at Oklahoma Feeders, Inc., 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 steers graded 33 percent Choice, had an average daily gain of 3.25 pounds per head per day and had a feed cost of gain of $0.43 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. Thirty-three percent of the steers fit the combined standards. Steers that met the industry standards had higher average daily gain (3.32 vs. 3.24 pounds) and averaged $80 per head more than those not fitting the industry standards.

- The Arkansas Beef Improvement Program identified that four of the top five costs 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. Therefore, a reducing winter feed cost focus program was implemented during the fall of 2002. The objective of the program is to demonstrate cost-effective beef cattle and forge 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. During the winter of 2002-2003, Extension has established 45 demonstrations in 21 counties. Production and economic data will be collected to document production practice success.

- Proper selection and culling of individual animals within a cow-calf herd is important for genetic improvement and enterprise profitability. The Cow Herd Performance Testing Program gives beef cattle producers the opportunity to determine and evaluate the current level of herd productivity and properly rank individual animals in the herd for economically relevant traits. The Cow Herd Performance Testing Program emphasizes the importance of record keeping and making selection/culling decisions based on performance measurements. The program involves the collection of records (weaning weights, cow weights, muscle scores, body condition scores, hip heights, etc.) to objectively measure and evaluate cattle performance. Recommendations for selection of replacement heifers are based on 205-day adjusted weaning weight, frame size, muscle score and other relevant factors. Recommendations are developed for culling mature cows based on most probable producing ability, cow efficiency, frame size and disposition among other factors. Calf performance differences may also be compared among herd sires. Dramatic calf weaning weight improvement is one of the benefits of the program that has been realized by many past and current participants.

- Sire selection is one of the most important decisions confronting a cow-calf producer. The On-Farm Bull Performance Testing Program evaluates postweaning performance of bulls within a contemporary group (bulls of similar age and breed composition that are managed alike) to provide information that can be used in selection of superior breeding animals. This program is designed to separate bulls based on genetic potential for growth performance and contribute information to national sire evaluations. Young bulls that are being considered for sale as breeding animals or for being incorporated into a breeding program are potential candidates for performance testing. Two types of on-farm performance tests are offered: a 112-day feed-based test and a 168-day forage-based test. Data collected as part of on-farm bull tests include bull weights, yearling hip heights, and yearling scrotal circumference measurements. Participating in an on-farm, bull-testing program can provide cattle producers with valuable selection and marketing information that may help improve herd genetics, increase information available to prospective bull buyers and improve the value of bulls marketed. Producers also learn about proper bull development and management.

- The Arkansas Cattle Growers' Conference is an annual event held at the Clark County Fairgrounds. The one-day program is organized and planned by a committee of producers and Extension and allied industry personnel. Typically, over 100 stocker cattle producers from Arkansas, northern Louisiana and northeast Texas attend. Speakers from all over the south-central United States present 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. This conference is rapidly gaining the reputation of being the premier annual educational event for stocker cattle producers within 150 miles of Clark County.

- A livestock auction barn survey was conduced in 2001 to determine the factors that affect the price of replacement and cull cows. Livestock market reporters collected data (weight, frame size, muscle score, breed, etc.) from 15 sale barns in order to determine these factors. Data were collected on more than 23,772 females. The results of the survey were published *Arkansas Cattle Business* and in an Extension fact sheet and presented at county educational programs.

Extension Program Results and Accomplishments

Output Indicators

26,620	Number of producers attending educational programs.
2,404	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on beef cattle nutrition.
5,326	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on beef cattle genetics and selection.
1,113	Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on beef quality assurance.

Outcome Indicators

2,074 Number of producers who changed their animal nutrition management practices.

1,044 Number of producers who changed their genetics and selection practices.

1,711 Number of producers who changed their animal health management practices.

Source of Funds

Smith Lever

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 – Lincoln, Lonoke, St. Francis, White, Calhoun, Clark, Dallas, Garland, Grant, Hempstead, Hot Spring, Howard, Little River, Miller, Nevada, Perry, Polk, Pulaski, Saline, Sevier, Union, Baxter, Benton, Boone, Carroll, Crawford, Faulkner, Franklin, Fulton, Izard, Johnson, Logan, Madison, Pope, Searcy, Sebastian, Stone, Van Buren, Washington, Greene and Yell counties

Programs of Excellence

Supplemental Feeding

Beef cattle producers can reduce their supplemental feed cost by forage testing their hay.

General Program Information – Beef cattle producers produce hay in the spring and early summer to provide their cattle with winter feed. More times than not, the nutrient content in the hay is at not sufficient levels to provide the protein and energy (TDN) required by cattle. Therefore, by forage testing the hay to determine the protein and TDN content of the hay and comparing those values to the nutrient requirements of cattle, matching a cost-effective supplemental feed can reduce winter-feed cost and improve beef cattle performance.

Number of Counties Involved – 6

Impact Numbers – Kim Tipton, Madison County beef producer, believes in forage testing. Mr. Tipton tested three lots of hay this past winter. He found one lot of hay could be fed to replacement heifers and meet most of their requirements. As a result of forage testing, he was able to change supplement and save $0.60 per head for a 100-day hay-feeding period ($60 per head savings). His $12 investment in forage testing saved him $348.

CES Section Contact Person: Gerald Van Brunt, Madison County Extension Agent, 479-738-6826, gvanbrunt@uaex.edu; Shane Gadberry, Animal Science Section, 501-671-2169, sgadberry@uaex.edu; and Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu.

County Bull Performance Testing Program

Performance testing is one method to evaluate growth genetics in bulls.

General Program Information – In Greene County, no producer is large enough to conduct his own single bull performance test, but one producer had the facilities to conduct a county, or area, test. This producer provided the facility, labor and feed at a minimum fee to conduct a performance test for area producers.

Number of Counties Involved – 1

Impact Numbers – In 2001-2002, three separate bull performance tests were conducted that provided data on 35 bulls for 10 producers. This program required a beginning weight and hip height measurement plus weights taken every four weeks.

CES Section Contact Person: Allen Davis, Greene County Extension Agent, 870-236-6921, ardavis@uaex.edu, and Dr. Jane Parish, Animal Science Section, 501-671-2162, jparish@uaex.edu.

Cow Herd Performance Program

To demonstrate how cow-calf production records can be used to improve the herd genetically.

General Program Information – Over a period of four years, data was collected on approximately an 80-cow herd owned and managed by Hempstead County cattle producer, Mrs. Clovy Keaster. Cows were weighed, frame scores obtained and body condition was determined annually. Calves were weighed to determine 205-day adjusted weaning weights.

Number of Counties Involved – 1

Impact Numbers – As a result of the program, Mrs. Keaster reported an increase in pounds of calf weaned per animal unit, a reduced calving season, better sire selection and better prices received at the market place. The cow herd improved by replacing the poor-producing cows with heifers from the high-producing cows.

In September 2002, Mrs. Keaster said, "When we started this project, I thought I was doing good when I weaned a 400-pound calf, now I am weaning calves at less than seven months of age that weigh over 600 pounds".

CES Section Contact Person: Rex Herring, Hempstead County Extension Agent, 870-777-5771, rherring@uaex.edu, and Dr. Jane Parish, Animal Science Section, 501-671-2162, jparish@uaex.edu

Arkansas Cattle Growers' Conference

After recognizing the need for a beef cattle stocker meeting, four county agents and one specialist began the Arkansas Cattle Growers' Conference.

General Program Information – Producers, county agents and specialists meet annually to develop the program content. This program addresses the educational needs of the professional stocker cattle operator. It has quickly become the premier stocker cattle conference in the Southeast.

Number of Counties Involved – 4

Impact Numbers – In 2002, allied industry recognized the educational value of the conference to the point that they provided funds to support the activity. Approximately 150 producers attended the meeting. This past year's conference theme was "Receiving – The Most Critical Period During Ownership."

CES Section Contact Person: Jerry Clemons, Clark County Extension Agent, 870-246-2281, jclemons@uaex.edu

Program Response: Dairy Cattle Management

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

Situation

The number of dairy herds in Arkansas continued to decrease. There are approximately 315 dairies in Arkansas with a total of 33,000 dairy cows. The average milk production per cow was 12,343 pounds. The Arkansas dairy industry produces about 432 million pounds of milk per year. Milk income was $68 million per year, and total economic impact of the dairy industry was $400 million. Depressed milk prices, waste management and efficiency of milk production continued to be major concerns of the Arkansas dairy industry.

Stakeholder Input

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 industry 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. Milk income was $68 million per year, and total economic impact of the dairy industry was over $400 million for milk, dairy beef, heifers and processing. 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. Although production costs in Arkansas are less than many states, which have higher investment costs per cow, milk production per cow in the state and bordering states is among the lowest in the U.S. 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.

- State regulations require that dairies have a waste management permit or a management plan to control waste runoff. A cooperative effort with the Natural Resources Conservation Service (NRCS) and other agencies resulted in over half of the dairy farms in Arkansas being approved to initiate construction of improved waste management facilities to comply with animal liquid waste regulations. 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. In 2001, the average milk production per cow for DHIA herds was 16,075 pounds compared to the state average of 12,343 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.

- Forage quality continues to be a limiting factor for milk production in the state, as does heat stress, and emphasis in meetings was placed on improved quality of forages. Multi-disciplinary demonstrations involved heat stress in the holding pen and feeding area, fly ash for use in high-traffic areas, economic value of manure, and fly control on the dairy utilizing parasitoids. Additionally, demonstrations to show the fertilizer value of manure were conducted on dairy farms.

- Two dairies that milk 1,000-1,200 cows per farm are now in Arkansas. Both dairies cooperate extensively with Extension personnel and have planned demonstrations for next year. These dairies are among the most modern in the U.S., which affords Extension the opportunity to inform other producers in Arkansas of their technology.

- Dairying remains an economically important enterprise in Arkansas as the sale of milk and dairy cattle averaged about $110 million over the past 10 years. 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 more 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. Also, Coleman-Turner Dairy is constructing a new facility with potential to process more milk in spite of decreased milk production in the state. The expansion is especially relevant now as Tyson closes swine facilities in northwest Arkansas, and the number of dairy farms continues to decline.

Extension Program Results and Accomplishments

Output Indicators

670 Number of producers attending educational programs (including Extension-related industry

meetings), field days, etc., and receiving educational materials.

274 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on management records, nutrition, reproduction and health.

342 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on forage production and grazing management.

203 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on manure management and cow comfort.

200 Number of educational materials produced.

Outcome Indicators

122 Number of participants who changed their management practices to improve records and production techniques.

147 Number of participants who changed their forage and grazing management production practices.

101 Number of participants who changed their manure management and cow comfort records.

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 – Pulaski, Faulkner, Conway, Van Buren, White, Searcy, Boone, Franklin, Benton, Washington, Greene, Carroll, Izard, Madison, Pope, Pike, Grant, Logan, Fulton, Yell, Columbia, Stone, Marion, Baxter, Saline and Scott counties

Program Response: Forage Production and Management

Contact: Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu and Dr. Wayne Coblentz, Animal Science Section, 479-575-7914, coblentz@uark.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. There are 2 million acres of bermudagrass, fescue and native mixed grasses (total 6 million acres) managed to enhance livestock production and land stewardship.

Stakeholder Input

Musk thistles are a serious problem in pastureland in north Arkansas and are spreading across the state. Heavy infestations of thistles reduce forage production and cause cattle to avoid infested areas. Controlling this weedy pest depends on continuous efforts and education. A statewide steering committee was formed in 1998 with staff from the Arkansas Soil Conservation Commission, NRSC, Arkansas Highway Department, Extension Service, Animal and Plant Health Inspection Service and the Arkansas State Plant Board to combine efforts toward controlling musk thistle.

Overview

- A forage database containing forage samples and poultry litter samples that were analyzed from 1985 to 2002 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 having 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. Fifty-one grazing schools were conducted during 1996-2002 with over 2,400 participants. These schools were provided on a fee basis of $95 per participant during 1996-1997. Grants provided funding for 16 schools during 1998-2002. Schools conducted in 2002 emphasized a seasonal approach to planning and managing forage to reduce winter feed costs and to gain more grazing days per year.

- Two species of weevils that aid in biological control of musk thistle have been found in 14 counties. In 2001, field surveys confirmed that the rosette weevil is also established in Conway, Faulkner, Van Buren, Cleburne, and White counties bringing the total to 18 counties. Further survey work will be conducted. Weevil collections will be scheduled to allow county agents to move these weevils into areas with no confirmed weevil population.

- The Arkansas Forage and Grassland Council (AFGC) was organized 28 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.

- Alfalfa acreage in Arkansas has declined from a high of over 112,000 acres to around 25,000 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.

- To establish an educational base across the state, an in-service training was conducted to update agents on improved practices for alfalfa. Participant surveys were very favorable for the training. Alfalfa fact sheets have been revised, and others are being revised for alfalfa management. A reference notebook was provided to agents that included much of the current information for alfalfa and bermudagrass production.

- Demonstrations highlighting grazing and hay production of alfalfa were established in seven counties. Field days were held for three of these demonstrations to show recommended practices for growing alfalfa. Forage production of stands has been good, and county agents are gaining valuable experience with this forage.

- 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. First year results are good and indicate that this may be an effective establishment practice. Treatments being studied to improve establishment include planting date, bermuda residue management and insect control.

- Many bermudagrass fields have high soil phosphorus (P) due to repeated applications of swine or poultry waste. The only way to effectively reduce high soil P is to remove P in the forage. Many producers find it too expensive to purchase enough commercial nitrogen fertilizer to produce high yields of bermudagrass for lowering soil P. Since alfalfa does not need nitrogen fertilizer, it has the potential to reduce high soil phosphorus levels by allowing production of high quality forage at a low fertilizer cost compared to a grass-based system.

- 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, which are 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. A total of 46 farm demonstrations are

underway. 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. For example, in 2001 producers using stockpiled forages saved from $5 to $41 per herd when grazing stockpiled fescue in winter instead of feeding 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, the soil at the site, its suitability for wildlife habitat, forage production and livestock needs, and plant identification. In-service training was conducted in 2001 and 2002 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. At the Mid-America Grassland Evaluation Contest, Arkansas 4-H teams have taken the top honors each year.

Extension Program Results and Accomplishments

Output Indicators

4,146 Number of educational meetings, demonstration farm visits and/or field days held to educate clientele on forage production and grazing management.

2,126 Number of educational meetings, demonstration farm visits and/or field days held to educate clientele on beef cattle nutrition.

Outcome Indicators

2,910 Number of participants who changed their forage and grazing management production practices.

1,896 Number of participants who changed their beef nutrition management practices.

Source of Funds

Smith Lever, Arkansas Grazing Lands Advisory Committee funds

Scope of Impact

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

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

Programs of Excellence

Bermudagrass Herbicide Demonstration

An herbicide to control grassy weeds in hybrid bermudagrass fields was successfully demonstrated.

General Program Information – In the past, it has been a losing battle for farmers to control most unwanted grass species in bermudagrass sod. Plateau, an herbicide to control grassy weeds, was introduced and demonstrated in Hempstead County.

Number of Counties Involved – 2

Impact Numbers – Demonstration plots were established in Tifton 44 bermudagrass fields. The bermudagrass stand was being taken over by grassy weeds. Different rates were applied, and plots were sprayed in the same fashion a producer would spray a field. As a result of the demonstration, four ounces of Plateau controlled crabgrass but only suppressed the dallisgrass. Six ounces, however, did an excellent job of controlling the dallisgrass. Other producers have visited the demonstration plots, and many plan on adopting this practice to help their own bermudagrass fields.

CES Section Contact Person: Rex Herring, Hempstead County Extension Agent, 870-777-

5771, rherring@uaex.edu; Gerald Alexander, Hempstead County Extension Agent, 870-777-5771, galexander@uaex.edu; and Larry Keaton, Boone County Extension Agent, 870-741-6168, lkeaton@uaex.edu

4-H Grassland Evaluation Contest

4-H youth had an excellent opportunity to learn more about wildlife habit, pasture stewardship and livestock grazing by participating in the Grassland Evaluation Contest.

General Program Information – With Searcy County's primary industry being agriculture, the Searcy County Extension Council recognizes the need to provide opportunities for youth in agriculture. One opportunity is the 4-H Grassland Evaluation Contest. Judging team activities also teach youth primary lifetime skills such as teamwork, self-esteem, communication skills and goal setting.

Number of Counties Involved – 1

Impact Numbers – Four Searcy County 4-H members participated in the 2002 Grassland Evaluation Contest. These members participated in eight county training sessions and completed self-study time to prepare for the contest. They learned a curriculum on grassland evaluation, soil evaluation, wildlife habitat evaluation and plant identification.

The Searcy County team competed in the Arkansas State Grassland Evaluation Contest and placed third with qualified them for the national competition. The team returned home and continued practices with a goal to win nationals. Three team members attended the Mid-America Grassland Evaluation Contest and won the 4-H Division. The three 4-H members placed first, third and fifth as individuals.

CES Section Contact Person: Danny Griffin, Searcy County Extension Agent, 870-448-3981, dgriffin@uaex.edu and Dr. John Jennings, Animal Science Section, 501-671-2350, jjennings@uaex.edu

County Ryegrass Variety Demonstration

A ryegrass variety demonstration helped identify which variety would work best in Ashley County.

General Program Information – Beef cattle producers in Ashley County were asking questions about what variety of ryegrass grows best in their county. This gave the opportunity for Extension to conduct a ryegrass variety demonstration.

Drew County Farm Supply and Seed Company furnished the seed and a new drill supplied by the Ashley County Conservation District was used to plant the different varieties. Varieties were compared on a weekly basis from November to June. Data collected included growth habits, leaf surface and other traits. Beef producers visited the plots.

Number of Counties Involved – 1

Impact Numbers – Over 100 producers received information on the Ashley County ryegrass variety demonstration. This useful information will assist cattle producers is selecting the right ryegrass variety to plant for their farm and the best method for which to plant and manage the variety.

CES Section Contact Person: Larry Smith, Ashley County Extension Agent, 870-853-2080, lwsmith@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 Corrections may be the largest horse operation in Arkansas with an inventory of 465 head, a breeding herd of 55 mares and 6 stallions, with the balance being saddle horses, weanlings, yearlings and two-year-olds. On any given day, the Department of Corrections may use 130 saddle horses at the various units around the state. The Extension equine specialist was asked to develop three programs: one for the inmates that do the horse breaking and training and two 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 $3.5 billion industry. Recreation is the number one reason for horse ownership with trail riding, weekend horse shows and rodeo events the leading pastimes. Although there is a thoroughbred racetrack that contributes to the local economy seasonally through training facilities and on-site wagering, there are a number of thoroughbred breeding farms that 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. This past year, six short courses were taught.

- Positive Reinforcement for Excellent Performance (P.R.E.P.) 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. Ten P.R.E.P. training sessions were conducted in 2002 with 1,500 in attendance. A video of the training was produced and is being used in Arkansas and nine other states.

- The program designed for the Arkansas Department of Corrections, for the inmates, was conducted at the Wrightsville Unit over a three-day, eight hours per day period. The program included basic training using horse psychology, behavior and social structure of the herd. Each participant (eleven total) was supervised while they saddled and rode a previously unridden horse.

- The second program was designed and taught as an in-service training for all officers that ride horses. The eight-hour program included basic horsemanship, bits and their functions, saddle fit, firearm safety while horseback and working with problem horses. Each officer rode and was evaluated. The in-service was taught at ten Arkansas Department of Corrections units with 160 participants total.

- A third program was developed at the request of the Arkansas Department of Corrections. In 2002, ADC requested that the Extension horse specialist design and implement advanced horse-training classes for officers responsible for supervising employees that ride horses daily. A five-day, 40-hour curriculum was designed and implemented in April 2002. Each class attendee started a two-year-old from first handling to basic riding. Ten barn supervisors selected an unridden two-year-old colt at the beginning of the class. It was intended that all horses would be ridden with some basic horsemanship principles applied by week's end. The success rate for these goals was 100 percent.

- The Cooperative Extension Service specialist responsible for horse programs worked with the other two cooperating organizations to plan the EIA Verification Program. The specialist wrote the teaching curriculum, designed and produced the visual aids and trained the Arkansas Livestock and Poultry Commission personnel that taught the classes. To date, there have been over 1,400 participants. In 2002, the Arkansas Cooperative Extension Service agreed to be responsible for the educational component of the EIA Verification Program. CES received a $30,000 grant from Arkansas Livestock and Poultry Commission to conduct the program.

Extension Program Results and Accomplishments

Output Indicators

2,456 Number of producers attending educational programs (including Extension-related industry meetings), field days, etc., and receiving educational material.

286 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on general horsemanship and equitation.

152 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse nutrition.

480 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on pasture management and hay quality.

186 Number of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on horse health.

40 Number of educational materials produced.

Outcome Indicators

761 Number of participants who improved their equitation and horsemanship skills.

432 Number of participants who changed their horse nutrition management practices.

515 Number of participants who changed their horse grazing management practices and improved hay quality.

755 Number of participants who changed their horse health management practices.

Source of Funds

Smith Lever, Arkansas Livestock and Poultry Commission, 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 – Polk, Yell, Johnson, Pulaski, Stone, Clay, Union, White, Carroll, St. Francis, Lincoln, Boone, Searcy, Desha, Jackson, Hempstead, Arkansas, Logan, Saline, Jefferson, Madison, Greene, Baxter, Washington, Van Buren, Craighead, Izard, Monroe and Cross counties.

KEY THEME: DIVERSIFIED/ALTERNATIVE AGRICULTURE

Program Response: Alternative Animal Production, Rabbit and Worm Production

Contact: Billy J. Moore, Extension Alternative Agriculture Specialist, Dale Bumpers Small Farms Research Center, Environment and Natural Resources, 479-675-5585, bmoore@uaex.edu

Situation

Approximately 200 swine and poultry producers are without contracts with companies. Consequently, they have no income from existing facilities. However, payments continue on farms and facilities. This has been devastating to families and communities hit hard by these actions. Rabbit and worm production have been two of the options made available to producers. Partially through Extension's efforts, a "new age" rabbit cooperative has been formed, allowing rabbit producers at least two options for marketing, which removes much of the risk involved in alternative animal production. Rabbit and worm production complement each other. Extension has offered education and technical advice to over 40 prospective producers.

Stakeholder Input

Information was obtained from focus groups, individual producers, county and state Extension personnel, County Councils, marketing groups and other agencies and organizations.

Overview

Rabbit and worm production offers small and medium sized farms an opportunity to produce an income from existing buildings and facilities without a high level of capital inputs. For a $15,000 investment, a producer could realize a $50,000 to $60,000 income over time. This is not to say there are not risks involved – there certainly are. However, the formation of a marketing cooperative for the rabbits helps reduce this risk and allows for better profits. From a single doe rabbit at this point in time, a producer can realize from $90 to $120 profit. A producer can grow into the rabbit and worm business so that production can start without large capital outlays.

Extension has provided expertise to growers and cooperative personnel so as to expedite both the forming of the cooperative and economical, disease-free production of animals..

Extension Program Results and Accomplishments

Output Indicators

5 meetings have been held with producers and industry personnel.

6,212 producers or potential producers have attended meetings and/or other educational meetings

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Outcome Indicators

136 rabbit producers are now members of the cooperative. Most are new producers

Source of Funds:

General State Funds

Scope of Impact:

Dissemination: Multi-state availability of cooperative and educational programs.

Scope of Program: Program is not state specific. Counties affected: all 75 counties are eligible for participation.

Programs of Excellence

Rabbit Production on Small Farm

Family Farmer Converts to Rabbit Production

General Program Information – Karen Chapman of Logan County has raised and shown rabbits since high school.

She is a charter member of the Rabbit Cooperative, the American Rabbit Growers Association. She is converting to commercial rabbit production. The availability of markets and of educational materials and accompanying expertise has convinced her that commercial rabbit production is a viable means of supporting a small family farm. Her farm income should double in the next two years.

Number of Counties Involved – Logan County

Impact Numbers – Program is available to all 75 counties.

CES Section Control Person: Billy J. Moore, Extension Alternative Agriculture Specialist, Dale Bumpers Small Farms Research Center, Environment and Natural Resources, 479-675-5585, bmoore@uaex.edu

KEY THEME: GIS/GPS

Program Response: Using Spatial Technology (GPS/GIS/Remote

Sensing) for Recreational and Navigational Use

Contact: Mike Daniels, (501) 671-2281 (Environmental and Natural Resources); Becky McPeake (501) 671-2285 (Environmental and Natural Resources); Bill Kinkaid (Environmental and Natural Resources); Tom Riley (Environmental and Natural Resources); Suzanne Wiley (Environmental and Natural Resources)

Situation

Spatial technology, such as Global Positioning Systems (GPS), geographic information systems (GIS), and remote sensing, has rapidly emerged as an important navigational and map-making tool that has the potential to enhance our every day life. For example, GPS is optional equipment on some new vehicles, and many rental cars offer GPS to assist with navigation to unfamiliar destinations. Recreational users such as hunters, hikers and boaters have begun to use GPS and GIS to assist with orienteering in unfamiliar surroundings. First response search and rescue volunteers are using spatial technology in emergency situations.

Many people do not realize the potential of this technology due to its rapid emergence and its recent availability for civilian use. Most recreational and navigational GPS/GIS users are not coveting an expensive short course or training session, but can fulfill their educational needs through short, informal, "hands-on" primers such as offered by Extension.

Stakeholder Input

Stakeholders included outdoor enthusiast clubs such as hunting, boating, hiking and fishing clubs; emergency response volunteers and rural volunteer fire fighters.

Input from these groups was solicited during other Extension programs including forestry, wildlife, water quality and other natural resource meetings. These groups were targeted because of the natural connection to navigation needs. For example, at a county wildlife program that we sponsored, we had a short presentation on using GPS to map hunting leases. From this presentation, the Yell County Wildlife Federation approached us about training their membership, which we subsequently did. County Extension agents have collected input from County Extension Councils as well as from local clientele by promoting the use of spatial technology at county events.

Informal input from the groups mentioned was compiled, and some common comments readily emerged. These groups were not interested in technical information on the principles of spatial technology, but rather were interested in the applications of the technology as it related to their interest. They were also interested in gaining confidence in using hand-held GPS units. The most common desire was to have hands-on experience and instruction.

Finally, we conduct a survey-based evaluation for each program delivered. This input is valuable in designing future programs.

Overview

A GIS/GPS educational program has been developed that provides participants, whose primary use is recreation or safety, an introduction in using GPS for general navigation and GIS for computerized map-making. Program participants have included hunters, hikers, boaters, outdoor enthusiasts, youth, school teachers, 4-H volunteer leaders, as well as first response emergency volunteers and volunteer fire departments. Programs include "hands-on" exercises with GPS units and computer mapping demonstrations using 40 Garmin GPSIII Plus units obtained from a grant from the University of Arkansas Forest Resources Center (Becky McPeake, principal grantee) in FY1999. Participants learn to establish waypoints, navigate to waypoints, log traveling routes, transfer information to a GIS and make maps with the information collected.

For youth, GPS and GIS offer a fun and exciting platform to learn more about navigation, orienteering and map reading skills. Activities such as GPS treasure hunts, "know your map" and "make

your own map with GIS" provide 4-H youth and school enhancement programs with an introduction to spatial technology.

These programs are valuable to participants not only for recreational use, but also to increase their navigational ability that could lead to increased job skills and safety.

Extension Program Results and Accomplishments

Output Indicators

114 Number of educational meetings for recreational GIS/GPS users.

265 Number of participants in "hands-on" training exercises.

150 Number of 4-H youth and students who participate in school enhancement programs that participate in GPS/GIS activities.

Outcome Indicators

415 Number of participants who successfully complete the "hands-on" exercises.

1 Number of participants who feel more comfortable with GPS and GIS.

During FY2002, we received a grant from the Arkansas Space Grant Consortium (Becky McPeake and Suzanne Wiley, project leaders) for training county agents who would then train groups in the use of spatial technology using available curricula and "hands-on" training with GPS units and compasses. A core group of 6 specialists and 6 county agents planned 4 in-service trainings for FY2003. Ten members attended a 2-day remote sensing/GPS workshop at the Stennis Space Center in Mississippi. Once these in-service trainings are conducted, we expect that output and outcome indicators will increase significantly.

A significant outcome is that participants have gained confidence in using hand-held GPS units, with many actually purchasing units for their use. As GPS becomes a tool in everyday life, participants will be better positioned to derive economic and safety benefits, thus enhancing their quality of life.

Source of Funds

Smith Lever, University of Arkansas Forest Resources Center, EPA, Arkansas Game and Fish Commission, Arkansas Space Grant Consortium

Scope of Impact

Dissemination – Three fact sheets have continued to be distributed that cover basic GPS issues**.** Poster and oral presentations on this program were made at two national conferences, one regional conference and one multi-county landowner workshop in FY2002. A packet of training resources for the in-service "Train the Trainer" program has been developed.

Scope of Program – "Hands-on" workshops were held in 10 counties, the State 4-H Center, Wildlife Habitat Improvement Workshop and Becoming an Outdoor Woman Workshop. Presentations were made at several meetings across the state in multiple counties. With implementation of the training program, these numbers should increase significantly.

KEY THEME: HOME LAWN AND GARDENING

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. Approximately 4,600 Master Gardeners have been trained to date. In 2002, 582 new Master Gardener volunteers were trained, with 1,500 active Master Gardeners sharing their talents statewide, for a total pool of 2,100 active Master Gardeners in the state.

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

8,616 Number of educational publications, mass media and other materials produced as a means to disseminate new ideas to consumer clientele and other interested parties.

249 Number of educational meetings and demonstrations held to educate consumers.

143 Number of workshops on horticultural-related topics conducted to educate consumers.

44,587 Number of individuals attending educational meetings, demonstrations or workshops and receiving educational materials.

Outcome Indicators

27,132 Number of participants who report improved satisfaction from leisure gardening activities.

35,245 Number of participants who improved their home garden or landscape.

– Master Gardeners volunteered 71,719 hours in the state, and accrued 34,828 hours in additional educational hours. In dollar terms, using a $14.00 per hour rate for a trained volunteer, this had an impact of $1,004,066.00 on our county programs!

Source of Funds

Smith-Lever 3b and 3c

Scope of Impact

Dissemination – Arkansas

Scope of Program – 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 Spring, 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.

KEY THEME: INNOVATIVE FARMING TECHNIQUES

Program Response: Strawberry Plasticulture Production System Education

Contact: Keith Striegler, Extension Horticulture Specialist, 479-575-2790, Horticulture

Situation

Strawberry production in Arkansas has under gone dramatic change during the past 10 years. There has been a major shift from the matted row system to the strawberry plasticulture system. Strawberry plasticulture is the annual hill training system in which 'green' strawberry transplants (freshly dug plants or plugs) are planted in early fall in double rows at densities of approximately 17,400 plants per acre on fumigated, raised beds that are covered with black plastic mulch. An important component of strawberry plasticulture in Arkansas is the Chandler variety. This variety's early maturity, tolerance of cool temperatures and long harvest period are vital to the success of plasticulture. In this system, growers harvest berries seven to eight months after planting compared to approximately 12 months for matted row methods. The picking season is normally six weeks, but in cooler-than-average spring temperatures, the harvest can last two months. After the strawberry season ends (early to mid-June), plants are destroyed and the plastic beds are sometimes reused for summer or fall vegetable crops. Intensive input of information is needed for growers to be successful using the strawberry plasticulture system.

Stakeholder Input

Stakeholders include commercial strawberry growers, county Extension agriculture agents and strawberry industry suppliers. Individuals and representatives of the Arkansas Strawberry Growers Association identify needs and provide critical review of the program. Programming is done on a county, state and regional basis. Programs include formal educational meetings, demonstrations, field days and educational materials.

Overview

The most significant issues facing persons involved in producing strawberries using the plasticulture system are:

Variety Selection and Planting Date – The combination of adapted variety and proper planting date is critical to the success of the strawberry plasticulture system.

Plant Nutrition Management – Optimal yield and quality can only be achieved when plant nutrition is optimal. Strawberry plant nutritional requirements are high and monitoring combined with effective application techniques is critical.

Disease and Insect Pest Control – Losses from pathogens can reduce yield, quality and profitability.

Reducing Production Costs – Growers need to recognize and manage all costs so that expenses are reduced. Production budgets allow growers to recognize and track expenses.

Extension Program Results and Accomplishments

Output Indicators

The following activities were conducted in 2002:

Demonstrations:

- Strawberry plasticulture varieties were demonstrated at the SWREC, Hope, Arkansas; VGSS, Kibler, Arkansas; and berries by Bill Strawberry Farm, Newport, Arkansas.

Educational Meetings:

- Strawberry Plasticulture Pre-Harvest Workshop, February 19, 2002, Arkansas Farm Bureau Building, Little Rock, Arkansas.

– Strawberry Plasticulture Pre-Plant Workshop, August 22, 2002, Arkansas Farm Bureau Building, Little Rock, Arkansas.

– Educational Materials Proceedings booklets prepared for Strawberry Plasticulture Pre-Harvest and Pre-Plant Workshops.

There are approximately 200 acres (industry estimate) of strawberries produced in Arkansas. The majority of this acreage is grown using the plasticulture system. Interest in this system continues to increase and additional plantings are anticipated in 2003. The Arkansas Strawberry Growers Association continues to grow and increase its level of involvement.

Outcome Indicators

– One acre of strawberry plasticulture produces roughly the same annual yield of 2.5 acres of matted row production.

Source of Funds

Hatch Act Funds, Smith-Lever 3b and 3c and industry grants and demonstrations

Scope of Impact

Dissemination – Arkansas. Information is disseminated through mailings, electronic messages, Extension web sites, personal communications, grower meetings and field days. In addition, strawberry nutrient monitoring is provided as a service to growers through the Agricultural Testing Laboratory.

Scope of Program – Benton, Craighead, Crawford, Faulkner, Franklin, Garland, Grant, Hempstead, Howard, Jefferson, Johnson, Jackson, Lawrence, Logan, Lonoke, Newton, Pulaski, Sebastian, Washington and White counties. Multi-state extension efforts exist between Oklahoma and Missouri primarily through involvement and programming with the Arkansas Strawberry Growers Association

Program Response: Using Cotton Gin Waste

Contact: Gary Huitink, 501-671-2237, Biological and Agricultural Engineering

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 are produced annually in Arkansas. Assisting cotton ginners and others to develop outlets for their gin waste as a vital soil amendment, heat source for power generation, component of livestock rations, etc., will improve their gin profitability.

Stakeholder Input

Educational efforts and consultation with ginners regarding gin waste options has developed some unique 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 as well.

Extension Program Results and Accomplishments

Output Indicators

– Approaches to manage and market gin waste to gain value was explained to ginners who participated in the Annual Cotton Ginners' School and in the Ginning section of the Beltwide Cotton Conferences at Atlanta, GA.

– Draft of publication "Gin Waste Alternatives" was presented as a paper at the Beltwide Cotton Conferences at Atlanta, Georgia, and will be used as a basis for recommendations in cotton-producing states.

Outcome Indicators

- Gin managers are now improving approaches to use waste properly. Most is utilized for agricultural or horticultural uses, including starting a composting facility in Desha County.

- A few gin managers are utilizing basic research to test market waste for creative uses.

- Arkansas gins have not been cited for environmental pollution.

- Dumas Gin Company contracts to have all of their waste removed from the gin yard and composted annually. Their cost of waste management is now reduced $10 to $15 per ton or approximately $20,000 in 2001 using a local composting entrepreneur. A number of gins have contracted to supply gin waste to restore recently-shaped fields. 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.

Source of Funds

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

Scope of Impact

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.

Dissemination: Arkansas (and cotton-producing states) gin managers and potential gin waste users.

Scope of Program

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.

KEY THEME: ORNAMENTAL/GREEN AGRICULTURE

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 businesses 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 $2 billion, 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 percent 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. Eleven 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 website. A statewide survey is being conducted to document the economic impact of the ornamental horticulture component of agriculture in Arkansas.

Extension Program Results and Accomplishments

Output Indicators

1,807 Number of educational publications, mass media and other materials produced as a means to disseminate new technologies to commercial clientele and other interested parties.

382 Number of educational meetings, demonstrations, nursery and greenhouse visits or field days held to educate commercial clientele and other interested parties.

65 Number of workshops on fertility, production, post harvest, marketing and/or breeding and selection conducted to educate commercial clientele and other interested parties.

3,451 Number of individuals attending educational meetings, field days, demonstrations, or workshops and receiving educational materials.

Outcome Indicators

2,065 Number of participants who adopted new production technologies.

27 Number of new commercial operations.

1,318 Number of participants who reduced their chemical and fertilizer inputs.

Source of Funds

Smith-Lever 3b and 3c

Scope of Impact

A significant increase in new or existing nursery production has been documented. The state's third largest rice producer is switching from rice production to field production of shade trees. This proposed nursery program should yield the client $180,000 in profit per year once harvest begins. The CES programs have also supported a significant increase in container production at the state's second largest container nursery.

Dissemination – Arkansas, Louisiana, Mississippi, Tennessee

Scope of Program – Cleburne, Craighead, Faulkner, Garland, Grant, Greene, Hot Spring, Independence, Lonoke, Perry, Pulaski, Saline, Searcy, Sebastian, Sharp, Stone, Union, Van Buren, Washington, White and Yell counties.

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

Arkansas is blessed with an abundant food supply. Poverty and food insecurity in some areas of the state are staggering. Availability of nutritious food helps sustain physical and mental well-being and helps avoid a long chain of medical problems. Intelligent expenditure of available resources should help avoid obesity and may reduce hunger or malnutrition. Improper nutrition may lead to high social and economic costs, high medical, educational and psychological problems. Arkansas ranks seventh in the nation for the highest percent of persons living in poverty. Educational challenges are heightened when working with limited resource groups.

The reported incidence of food-borne illnesses from pathogenic bacteria is increasing. Naturally occurring bacteria and other food pathogens are a major concern. Events of 9/11 have heightened the awareness of potential food contamination and the utilization of terroristic food chain disruption. A key to reversing the trends of increased disease is education to consumers and food handlers throughout the food production and marketing system. The paradigm of safe food may not be taken for granted. Education about intentional food contamination and a heightened awareness by all to this potential may avert additional incidents in the future.

Millions are impacted annually by illness from food they consume. Many deaths may be attributed to food consumption each year – particularly from the young, elderly and immune compromised. More and more people are eating food that is prepared away from home. Introduction of pathogens and their survival has a much higher potential in these environments than food that is properly prepared in the home. The key educational efforts focus around proper selection, storage and preparation of foods for both nutritional and safety aspects.

Arkansas producers store vast quantities of grain on the farm. Proper in-bin drying and management throughout the storage period is essential to maintain quality. Moderate temperatures in this region open up the possibility for numerous attacks by insects. Insect damage reduces the quality and marketable value. In extreme cases, insect-damaged grain may not be marketable at all. Research and on-farm demonstrations have shown that temperature management is a very effective tool for use in insect control strategies. Evaluations of this type technology will help provide an alternative to chemical usage.

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 internet and other broad scale broadcasting techniques have assisted with increasing contacts.

Total FTEs

Total Budgetary Amount

KEY THEME: FOOD QUALITY

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

Contact: Dennis R. Gardisser, Associate Department Head - Extension Engineer, 501-671-2241, Biological and Agricultural Engineering

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 big 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 on 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.

Arkansas engineers worked in concert with staff from the Arkansas Department of Corrections to design two new grain-handling facilities for the Cummins and Wrightsville prison systems. Engineers continue working with ADC to develop the most efficient operating guidelines for their new facility. Extension engineers are participating in the second year of a joint research project with food processing engineers and the staff at ADC to investigate alternative ways to control insects in rice storage other than using chemicals. This research effort has expanded this year to two other farms in the state.

Extension Program Results and Accomplishments

Output Indicators

15 Producer meetings to discuss grain drying and storage.

20 On-farm visits to work hands-on with producers on grain bin management strategies.

2 Research demonstration projects in full size bins.

8 Popular press articles.

315 Producers attended meetings on grain drying.

Outcome Indicators

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

Source of Funds

FSL, CSREES grant, Rice Research Promotion Board grant.

Scope of Impact:

Dissemination – This is a statewide and regional program that has been made available to all producers.

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

Program Response: Homeland Security

Contact: Dennis R. Gardisser, Associate Department Head - Extension Engineer, 501-671-2241, Biological and Agricultural Engineering

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

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 on 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.

Extension Program Results and Accomplishments

Output Indicators

25 Producer meetings to discuss grain drying and storage.

15 On-farm visits to work hands-on with producers on grain bin management strategies.

2 Research demonstration projects in full size bins.

6 Popular press articles.

485 Producers attended meetings on grain drying.

Outcome Indicators

13 Producers indicating that improved management techniques result in a better quality grain product, and in addition helps them market in a more timely fashion.

Source of Funds

FSL, Rice Research Promotion Board grant.

Scope of Impact

Dissemination – This is a statewide program that has been made available to all producers.

Scope of Program – Programs were presented in 21 of the primary grain drying counties.

KEY THEME: FOOD SAFETY

Program Response: Food Safety Education Programs

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

Situation

There are many challenges facing public health and the food supply. While the American food supply is among the safest in the world, each year millions of people in the United States are stricken by illness caused by the food they eat. Some, mostly the very young, the elderly and immune-compromised, die every year as a result. According to the President's Council on Food Safety, hospitalization costs for these illnesses are estimated at more than three billion dollars annually and costs from lost productivity are much higher.

Americans are eating more meals away from home. It is estimated that fifty cents of every food dollar is

spent on food prepared outside of the home. Food is not only purchased from grocery stores and restaurants, but is consumed in schools, hospitals, nursing homes, day care centers and other institutional settings. The chances for disease-producing errors increase as fewer people are involved in preparing their own meals.

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

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

Programming in food safety education 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)

7,170 Number of consumers participating in educational short courses or meetings related to sanitation and safety in food handling.

59,672 Number of people reached through food safety awareness programs, demonstrations or displays.

278 Number of media articles produced on food safety issues.

Outcome Indicators (Consumers)

4,894 Number of consumers who report improved sanitation in food handling.

Output Indicators (Producers)

316 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.

76 Number of food safety educational programs for growers, producers, distributors or retailers.

1,702 Number of participants attending non-certification programs for food handlers.

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

Outcome Indicators (Producers)

278 Number of food handlers certified.

324 Number of food service managers who report improved food handling practices within a commercial establishment.

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

Source of Funds

Smith Lever and program registration fees 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 2002 inlcude Pope, Johnson, Greene, Union, Columbia, Calhoun, Crawford, Sebastian, Boone, Little River, Miller, Howard, Washington, Benton, Craighead, Pulaski, Baxter and Stone. Additional food safety programs are likewise conducted statewide.

KEY THEME: FOOD SECURITY

Program Response: Expanded Food and Nutrition Education Program

Contact: Easter H. Tucker, Family and Consumer Sciences Specialist, 501-671-2099, Family and Consumer Sciences

Situation

Arkansas is a poor state. Arkansas ranks seventh in the nation for the highest percent (15.8 percent) of persons living in poverty according to Census 2000. 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 percent 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 the county staff to determine educational needs of low-income families in their county and to develop, implement and evaluate educational programs. The partnerships enhanced 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; 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, 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.

The EFNEP provides food and nutrition education for limited resource audiences in 22 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

4,197 Families participated in nutrition education programs.

3,158 Youth participated in nutrition education programs.

1,090 Participants completed 12 or more lessons of intensive nutrition education.

Outcome Indicators

The 1,090 intensive nutrition education program participants were given pre- and post-evaluation instruments, which evaluated behavior changes over the course of the program. The evaluation results are as follows:

Nutrition (Dietary Quality) Practices

957 (93%) Participants showed improvement in at least one or more nutrition practices.

607 (59%) Participants thought about healthy food choices more often when deciding what to feed their family.

493 (48%) Participants prepared foods more often without adding salt.

781 (76%) Participants used food labels more often to make healthier food choices.

393 (38%) Participants reported that they and their children ate breakfast more often.

Food Safety Practices

825 (77%) Participants showed improvement in one or more of the recommended food safety practices.

447 (41%) Participants more often followed the recommended practices of not allowing meat and dairy foods to sit out for more than two hours.

415 (38%) Participants always follow the above recommended practice.

790 (73%) Participants more often followed the recommended practice of not thawing foods at room temperature.

586 (54%) Participants always follow the above recommended practice.

Food Resource Management

969 (90%) Participants showed improvements in one or more of the recommended food resource management practices.

717 (67%) Participants planned meals in advance more often.

575 (54%) Participants compared prices more often.

510 (47%) Participants ran out of food before the end of the month less often.

717 (67%)	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, Conway, Craighead, Crawford, Crittenden, Desha, Garland, Hempstead, Jefferson, Lee, Miller, Mississippi, Monroe, Ouachita, Phillips, Pulaski, St. Francis, Searcy, Sebastian, Union, Washington and White counties.

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 diabetes rate in Arkansas is the 5th highest in the U.S. Approximately 156,000 Arkansans have been diagnosed with diabetes (about 78,000 are unaware of their condition).
- Arkansas has the 4th highest obesity rate. More than half of adults are overweight or obese.
- Childhood obesity in Arkansas has reached epidemic proportions, in which nearly 9 percent of children 0-5 years are obese, and students in the 9th-12th grades are reporting almost 11 percent obesity.
- In Arkansas in1999, hospital charges for obesity-related conditions were in excess of $125 million. Nearly two-thirds of these dollars came from state and federal government sources.
- Nearly 8 out of 10 Arkansans report they are not consuming the recommended 5 servings of fruits and vegetable a day.
- Almost 79 percent of adult Arkansans are at risk for health problems related to lack of physical activity.
- Osteoporosis affects 15 percent of Arkansans.

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.

Extension's *Reshape Yourself* weight management programs help Arkansans improve their eating habits, weight and health. The *Right Bite Cooking School for People with Diabetes* likewise helps the growing population of Arkansans with diabetes manage their disease. In 2002, 4,757 educational programs were offered around the state, with 56,069 participants. Participants reported improved blood pressure, improved blood lipid levels (cholesterol and triglycerides), improved blood glucose levels, improved body weight, improved fitness levels and reduced health care costs as a result of Extension nutrition education resources and programs.

Total FTEs

Total Budgetary Amount

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 has multiple health benefits including reducing the risk for heart disease and stroke, diabetes, obesity, certain cancers and osteoporosis. Yet even with all the known benefits, only 25 percent of adults in the United States report engaging in recommended levels of physical

activity. According to the Center for Disease Control, one of every four Arkansas adults does not participate in any regular physical activity.

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

526	Number of educational programs offered that relate to physical activity.
7,050	Number of participants attending educational programs related to physical activity.
102,319	Number of people reached through awareness programs, exhibits and media outlets based on topics related to physical activity.
8,340	Number of educational resources prepared related to physical activity.
99	Number of people who participated in the *Walk Across* Arkansas walking program.

Outcome Indicators

6,370	Number of people who plan to increase physical activity.
2,828	Number of people who increased physical activity.
126,605	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

Scope of Program: Approximately a dozen counties have indicated interest in implementing this program during FY03.

KEY THEME: HUMAN NUTRITION

Program Response: Reducing Risks for Chronic Disease – Nutrition

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

Situation

The typical Arkansas diet has too few fruits, vegetables and whole grains and too much fat. In conjunction with insufficient physical activity, this dietary pattern contributes to the development of serious lifestyle-related health problems. The latest mortality statistics for Arkansas show that approximately 31 percent of deaths are from heart disease, 22 percent from cancer, 9 percent from stroke and 2 percent from diabetes. The Dietary Guidelines for Americans are ten research-based recommendations to help Americans build healthful eating habits and lifestyle practices that will decrease their risk for these chronic diseases. The

Dietary Guidelines stress achieving and maintaining a healthy weight; increasing physical activity; increasing consumption of fruits, vegetables and whole grains and moderating consumption of fat, saturated fat, sodium and sugar. Extension's nutrition programs are designed to help Arkansans implement the recommendations of the Dietary Guidelines.

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.

Overview

Overweight and obesity, which increase the risk of many chronic diseases, are increasing among Arkansans of all ages. Approximately 60 percent of Arkansas' adults are overweight or obese. Additionally, 25 percent of children under five and 30 percent of teens in Arkansas 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. Extension's *Reshape Yourself* weight management program helps Arkansans improve their eating habits, weight and health.

Almost 8 percent of the Arkansas population has diabetes. According to the most recent health statistics, diabetes is the seventh leading cause of death for Arkansans. In addition to death, complications resulting from poor management of the disease include kidney disease, heart disease, stroke, lower extremity amputations, blindness, birth defects and premature death and disability. Recent research indicates better control of blood glucose levels delays or prevents the development of diabetes complications. Extension helps Arkansans with diabetes manage their disease by conducting the *Right Bite Cooking School for People with Diabetes* and special interest programs on diabetes.

Extension Program Results and Accomplishments

Output Indicators

4,757	Number of educational programs offered on topics related to one or more of the Dietary Guidelines for Americans.
56,069	Number of participants attending educational programs on topics related to one or more of the Dietary Guidelines for Americans.
655,523	Number of people reached through awareness programs, exhibits and media outlets based on topics related to one or more of the Dietary Guidelines for Americans.
1,957	Number of educational resources prepared related to nutrition and dietary guidelines.

Outcome Indicators

19,887	Number of people who plan to increase consumption of fruits and vegetables.
11,510	Number of people who increased consumption of fruits and vegetables.
15,348	Number of people who plan to increase consumption of whole grain foods.
10,160	Number of people who increased consumption of whole grain foods.
15,337	Number of people who plan to increase consumption of calcium-rich foods.
8,386	Number of people who increased consumption of calcium-rich foods.
16,358	Number of people who plan to decrease consumption of fat and/or saturated fat.
9,560	Number of people who decreased consumption of fat and/or saturated fat.

While the cost of screening blood pressure, blood lipids and blood glucose levels for all participants is

cost prohibitive, screening a sample of people enrolled in selected programs revealed that lifestyle changes made as a result of Extension's programs led to improvements in several health parameters.

1,023	Number of people who improved blood pressure.
710	Number of people who improved blood lipid levels (cholesterol and triglycerides).
513	Number of people who improved blood glucose levels.
1,496	Number of people who improved body weight.
2,638	Number of people who improved fitness levels.
994	Number of people who reported they reduced health care costs.

Source of Funds

Smith-Lever

Scope of Impact

Dissemination – Statewide availability.

Scope of Program – Seventy five (75) counties across Arkansas conducted nutrition programs in FY02 (Ozark = 25, Delta = 25 and Ouachita = 25).

Programs of Excellence

Extension's *Reshape Yourself* Helps Arkansans Eat Right, Get Active and Lose Weight

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.

Winifred G. of Ashley County found that learning about serving sizes and how to choose foods from all of the food groups finally made healthy eating "click." Writing down everything she eats each day helps her see how she can adjust her diet. Before she participated in the *Reshape Yourself* class, her sleep apnea made her afraid to go to sleep at night. Losing 26 1/2 pounds has helped her sleep better and has lowered her blood glucose from 299 mg/dl to 143 mg/dl. Now that she has lost 12 1/2 inches, she is wearing a smaller dress and bra size and feels great about it!

Positive feelings like Winifred's were experienced all over Arkansas. With seventeen counties reporting, 339 graduates in 23 classes lost 3,125 pounds by changing their eating habits and walking 21,668 miles. Two of every three graduates who checked their blood pressure and cholesterol before and after the course showed improvements in these parameters. Three of every four showed improvement in blood glucose levels.

Locations – Counties Conducting *Reshape Yourself* in FY02: Ashley, Cleveland, Crawford, Cross, Drew, Faulkner, Franklin, Independence, Little River, Logan, Newton, Phillips, Prairie, Sebastian, Stone, Union, Yell.

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

The Right Bite Cooking School for People With Diabetes and Those Who Love Them Helps Arkansans Manage Their Diabetes

An estimated 156,000 Arkansans have diagnosed diabetes, with prevalence being highest in the Delta. Controlling blood glucose levels through diet, exercise and medication can reduce the onset and severity of complications. The *Right Bite Cooking School* helps Arkansans with diabetes learn to manage their blood glucose levels by planning and preparing good tasting meals with less fat, salt and sugar, and more fruits, vegetables and fiber.

"Just coming here helps me keep on track and motivated," said one participant of the *Right Bite Cooking School* in Faulkner County. The school was a collaboration between Faulkner County

Cooperative Extension Service, Conway Regional Hospital and the local diabetes support group that reached 28 newly diagnosed type 2 diabetics with high quality, practical information to help them manage their diabetes. Twenty-four participants said they planned to incorporate some of the healthier recipes into their diets plans. Others said they were motivated to try lower-fat options for flavoring food. Response to the cooking school was so great that a second school was offered for those placed on a waiting list.

Similar responses have been heard by 26 county agents who have conducted the *Right Bite* program for over 500 Arkansans. After following healthy food preparation practices learned in the *Right Bite* program, many participants report improvements in blood glucose, blood pressure and blood cholesterol levels.

General Program Information –

Locations – Counties Conducting the Right Bite program in FY02: Ashley, Calhoun, Chicot, Clark, Clay, Cleveland, Columbia, Crittenden, Cross, Dallas, Desha, Faulkner, Garland, Grant, Hempstead, Hot Spring, Howard, Jefferson, Lafayette, Little River, Phillips, Saline, Searcy, St. Francis, Stone, Van Buren.

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 have emerged as a primary pest of cotton as a result of the use of transgenic cotton that has reduced insecticide use that previously controlled this pest. 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, soybean, is an intensively managed crop requiring timely irrigation, fertilizer and pesticides 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. In White County, these insects are serious pests of the table grape production. 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 of aircraft precision agriculture program makes chemical applications more efficacious and environmentally sound. Over 1,000 aircraft pattern analyses were performed on Arkansas aircraft for pesticide applications. 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 5,000 individuals are trained each year.

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.

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 nonindustrial 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 is an important issue since several years of drought, overcrowding, poor soils, inadequate management, insect damage and declining vigor have severely affected the oak forests. Extension is addressing the most critical information needs and issues that include forest management, education for county agents, natural resource, 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.

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 alterative 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 2.67 million tons of solid waste annually, 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 in environmentally safe methods to dispose of waste.

Total FTEs

Total Budgetary Amount

KEY THEME: AGRICULTURAL WASTE MANAGEMENT

Program Response: Animal Waste Management

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

Situation

Arkansas has 33,000 dairy cattle on approximately 300 farms and 685,000 head of swine placed at one time on 450 farms. Annual broiler production is 1.2 billion birds. Turkey production is 27 million birds annually. There are 1.8 million head of beef cattle on Arkansas farms. Annual Arkansas farm gate income from livestock and poultry is over $3 billion before support services, industry or further processing are added.

A 1997 study indicated that animal production in Arkansas generates 3.4 billion tons of manure on a dry weight basis each year. Annually the beef cattle,

poultry, swine and dairy industries generate 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 directed educational programs.

Overview

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.

All Arkansas livestock and poultry producers are 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.

Extension Program Results and Accomplishments

Output Indicators

1,878 Producers, industry, or agency personnel attended educational programs.

27 Educational meetings held with swine and poultry industry representatives, State and Federal agency personnel, and University of Arkansas research faculty to identify and discuss animal waste management issues.

744 Soil test databases developed from selected livestock and poultry farms, and all animal manure samples processed through the University of Arkansas testing programs.

– Approximately 24 meetings held with swine and poultry industry representatives, state and federal agency personnel, and University of Arkansas research faculty to identify and discuss animal waste management issues.

14 Annual certification-training meetings conducted for all owner/operators of confined animal operations with liquid manure handling systems.

27 Educational meetings, field days and/or demonstrations held to educated clientele on liquid and dry animal waste management.

48 Educational materials produced.

– Approximately 700 individuals representing over 500 farms attended annual liquid animal waste refresher training 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.

Outcome Indicators

– Over 1,700 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 outcome of Extension's educational effort.

– 1,236 growers with confined livestock and poultry operations that voluntarily participate in preparing nutrient management plans for their farm (preparation of plans by others).

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 543 permitted liquid waste systems received their state mandated annual training. The University of Arkansas processed 1,700 manure samples to provide producers information necessary to better manage their manure.

KEY THEME: FOREST RESOURCE MANAGEMENT

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

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 nonindustrial 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. The most critical information needs and issues include:

Forest Management – More than 60 percent 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 2001 and 2002.

Many landowners, especially in the 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.

Education for County Agents, Natural Resource and Other Professionals – Very few county agents have any formal training in forestry or related field. Agents also have less comfort with forest management programming than with traditional agricultural programming.

Beginning in 2000, all professionals referring to themselves as "foresters" must be registered by state law. To maintain registration, they must also take six hours of continuing education a year.

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 Continuing Education Advisory Board, the Arkansas Forest Resources Center, the U.S. Forest Service, the Independence County Landowner Association, Master Tree program attendees and the Master Tree Farmer steering committee.

Extension Program Results and Accomplishments

Output Indicators

1,586	Number of forest landowners, industry and/or agency personnel attending educational programs.

10 Number of educational meetings held with forestry industry representatives, state and federal agency personnel and University of Arkansas Cooperative Extension faculty to identify forest landowner education issues and plan education programs.

20 Number of landowner education meetings conducted.

20,000 Number of landowners identified as part of an 11-county education initiative in partnership with Ozark RC&D council receiving quarterly newsletter.

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

88 Number of landowners indicating an increased knowledge of how to market timber and principals of forest management.

88 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.

175 Number of landowner requests for Stewardship plans through the Ozark Foothills Forest Landowner Education Program.

88 Number of clientele indicating an increased understanding of general forest management including timber valuation and competitive marketing.

88 Number of clientele indicating an increased economic value of timber and other wood products sold, or money saved.

88 Number of clientele who changed management practices resulting from educational programs.

Source of Funds

Smith Lever 3b & 3c, USDA Forest Service, CSREES and Ozark Foothills Forest Landowner Education Project (OFFLEP), RREA

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 seven different sites across the state. Weekly radio program broadcast to five stations through the Arkansas Ag. Network.

Scope of Program

– 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, 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.

KEY THEME: INTEGRATED PEST MANAGEMENT

Program Response: Cotton Integrated Pest Management

Contact: G. M. Lorenz III, Extension Entomologist - IPM Coordinator

Situation

Cotton is grown on about one million acres in Arkansas each year with an average yield of about 735 pounds of lint per acre. Arkansas ranks fifth in cotton production in the United States. Insect losses due to arthropods (insects and mites) are estimated at about 7 to 9 percent each year for a loss of about $43 million. Management costs to prevent or minimize the impact of these pests is estimated at almost $140 per acre for Arkansas producers. The cost of control and loss for cotton production in Arkansas is estimated at over $165 million 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 GMO's. With the advent of transgenic cotton, particularly Bt 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 fewer applications being made for control of the bollworm/budworm complex and boll weevil.

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

Cotton is grown on about one million acres in Arkansas each year with an average yield of about 735 pounds of lint per acre. Arkansas ranks fifth in cotton production in the United States. Insect losses due to arthropods (insects and mites) are estimated at about 7 to 9 percent each year for a loss of about $43 million. Management cost to prevent or minimize the impact of these pests is estimated at almost $140 per acre for Arkansas producers. The cost of control and loss for cotton production in Arkansas is estimated at over $165 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 GMO's. With the advent of transgenic cotton, particularly Bt 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 fewer applications being made for control of the bollworm/budworm complex and boll weevil.

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.

Extension Program Results and Accomplishments

Output Indicators

1,369 Growers, consultants and others attending presentations.

1,400 Phone calls addressing insect questions from clientele.

397 Field calls to individual growers.

65 Presentations at grower meetings and field days.

91 Field demonstrations.

17 Counties participating in Cotton IPM Program.

14 Field days.

16 Popular press articles or interviews.

15 Insecticide evaluation reports.

15 Consultant training sessions.

5 Major Extension publications.

16 Presentations at professional meetings.

3 In-service trainings for county agents (in the field).

94 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.

Source of Funds

Smith-Lever 3d IPM funds, grants (Arkansas Cotton State Support Group of Cotton Inc.), gifts (various Crop Protection Companies), Federal Smith-Lever Funds-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.

Scope of Program – Cotton IPM presentations were made in every major cotton producing county (17). Cotton IPM field demonstrations were installed in all 17 counties during 2001. Cotton IPM county participation has held steady at 17 counties with $51,000 distributed in county IPM grants.

Program Response: Diversified Integrated Pest Management

Contact: Kelly M. Loftin, Extension Entomologist, Livestock and Imported Fire Ants, 501 671-2361

Situation

Agricultural production outside of the traditional row crop systems of the Delta in Arkansas is very diverse, involving agricultural systems that fit the hill areas. These agricultural systems, like the systems in the Delta, have a unique complex of pest problems which they must manage each year in order to operate their production system efficiently. Pest problems range from the several species of flies that significantly impact dairy production in Arkansas to grape producers dealing with many pest species such as grape berry moths, grape scale and grape root borer. Other pests species such as back flies not only have tremendous localized impact on a wide range of livestock species but also severely impact industry such as paper production (flies get

into paper and reduce quality) at the International Paper Mill in the Texarkana area.

In White County, the grape berry moth, grape scale and grape root borer are serious pests of the table grape production that has developed in that area. Retailers will not buy grapes that have insect damage and, therefore, it is essential for producers to maintain control of pests. Grape borer feeding also causes loss of vine vigor and yield and kills vines, thus reducing profitability in the production.

Livestock based agriculture including poultry, beef, milk and eggs accounts for about 55 percent of Arkansas' 5.6 billion in farm income generated annually. Pests associated with the many production animal systems are diverse and often have a significant impact on profits. For example, high populations of stable flies have been shown to cause a reduction in milk production of up to 40 percent. Horn flies may cause up to a 13 percent decrease in feed efficiency in calves as well as decreases in daily weight gains. The economic impact of livestock pests coupled with the scarcity of insecticides/insecticide classes have contributed to the development of insecticide resistance in a number of livestock pests (i.e., house flies, horn flies, etc.). Implementation of IPM strategies is critical in maintaining the profitability of livestock production.

Fly control on dairy farms is a constant problem during months of warm weather. Compounding this problem is the resistance of some flies to commonly used insecticides. Another factor limiting the use of pesticides on lactating dairy cows is the possible contamination of milk from some of the more potent insecticides, which are not approved for use on lactating cows. In addition, the use of these insecticides can be very expensive and likewise requires a great deal of time for producers to actually apply the insecticide on the animals.

If flies are not controlled on dairy farms, flies can cause agitation to the cows, requiring them to expend energy in fighting the flies that could be used to produce milk. Also, flies can spread disease from one animal to the other, which can result in cows producing at less than optimal efficiency. Diseases spread by flies include anaplasmosis, mastitis through the spread of organisms to the teats of close-by cows and other diseases such as Johnes and leptospirosis. Tight profit margins have led to a decline in the number of family owned dairies in Arkansas. Overall, dairy production in southern states is only about 50 percent of the per capita consumption.

Pest problems associated with agricultural production in dairy, horticultural and other endeavors are critical to profitability, just as in row crops. The Diversified Integrated Pest Management program was developed to focus programs toward agriculture production systems that have unique needs, in contrast to the traditional Delta programs. These programs involve using innovative methods to control pests that do not necessarily rely on pesticides to maintain control.

Stakeholder Input

A need for implementing Livestock IPM programs was identified by the Cooperative Extension Service. As a result, an Extension Entomology position with partial livestock pest responsibility was initiated July 1, 2002.

Arkansas' CES Dairy Production Committee identified fly control in and around dairies as a priority area to continue to focus on. Implementation of IPM programs involving cultural management augmented with biological control using parasitoids was the approach chosen.

One county council in a beef producing area selected fly control as an emphasis area. Their aim is to develop fly management programs that require less chemical input into the production system.

County agents requested adding pasture insect pest management into Extension's annual Forage Schools.

Each year county agriculture agents apply for Diversified IPM grants to conduct applied demonstrations and educational programs. This venue allows agents to conduct non-row crop IPM programs that are considered important to their

local producers and county councils. This program is continuing to grow and has expanded to include a very diverse list of commodities such as livestock, peach, pecan, grape, tomato, pasture, honeybee and alternative agriculture. Eighteen proposals were submitted in January 2003 with the vast majority being funded.

Overview

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, which makes 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, backrubbers, dust bags and even 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 is being evaluated and compared to conventional methods such as ear tags. The trap was constructed and set in place, but unfortunately the fly season was too near the end to collect data. Plans are underway to expand this demonstration to two other counties and add an automatic spray system into the evaluation process.

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 in 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.

In Van Buren and Searcy Counties a SARE sponsored producer grant was awarded to the Arkansas Dairy Cooperatives Association and conducted by the Cooperative Extension Service. This applied research and education program comparing the cost and effectiveness of using parasitoids against house and stable flies verses conventional insecticide control was a two-year project with a completion date of March 2003. Mixed fly parasites were released to control flies in dairy herds with 60 to 100 milk cows. The parasites were spread at a rate of 200 parasites per cow and 600 parasites per calf in locations near the milking facilities, feeding areas and manure storage. The farms were monitored on a weekly basis for house fly abundance with the use of 3 x 5 spot cards in the holding area and milking parlor. Stable fly

abundance was monitored by counting the number of stable flies found on all legs of a sample of 10 cows. The parasite release program to control flies was very successful, reducing the fly numbers by more than 90 percent. The program relies on the efficient use of manure management in conjunction with weekly parasite releases. The parasite release program has been well accepted by producers to this point. Results from the demonstrations were made available to farmers through posters and presentations made during field days and production meetings

Fall armyworms are herbivorous caterpillars that in cases of severe infestations will devastate pastures and hay fields. Loss of forage and hay meant for livestock can result in tremendous losses to producers. Sporadic outbreaks of armyworms occurred throughout the cattle producing areas of the state during 2002. Three insecticide evaluation trials were conducted during this outbreak. In addition, pasture pest management including armyworm control information was presented during producer Forage Schools.

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, and Bowie County, Texas, 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. Larva 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. Future plans involve evaluation of adult trapping systems using carbon dioxide and octanol to better determine the buffalo gnat dispersal from breeding sites.

The grape insect management program uses a pheromone disruption technology for grape berry moth and grape root borer. Results indicate that a substantial savings and reduction in the number of pesticide applications will be realized. The county agent involved has taken extensive data on the project, and the producers have been pleased with the results. Future work with the grape pest management program involves validation of modeling for black rot infection, impact of mass trapping of grape root borer and timely dissemination of grape IPM to producers.

Extension Program Results and Accomplishments

Output Indicators

10	Training sessions conducted on IPM.
2	Field days conducted.
150	Producers attended field days on dairy pest management.
128	Producers changed manure management practices.
–	Bi-monthly Black Fly management committee meeting.

Outcome Indicators

12	Dairies with 90 percent reduction in fly numbers.
6	Fruit producers adopted new insect management technology.
1	Buffalo gnat management program (area management). Protects livestock in Miller County, Arkansas, and Bowie County, Texas, and protects paper mill.
1	Pasture weed management.
3	Fall armyworm insecticide evaluation trials.

Source of Funds

Smith-Lever 3d IPM funds, grants (SARE), gifts (various companies), 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 – Seven counties have implemented this program and include White, Searcy, Van Buren, Franklin, Johnson, Miller, Greene and Lonoke counties. Danny Griffin in Searcy County, Mike Andrews in Van Buren County, Doug Petty in Miller County and Sherry Wesson in White County have implemented very successful programs and are excellent contacts for program development consultation.

Program Response: Fire Ant Education and Research Program

Contact: Donna Shanklin, Pest Management Section, 870-460-1893, shanklin@umont.edu; 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, 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, which 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 related 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 as 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, impacting 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-one Arkansas counties are the Federal Fire Ant Quarantine. 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 worldwide 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 though the county offices. However, since 1997, many of the publications can be accessed via the worldwide 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 lessons 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. 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, crop land, 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 county-wide infestations in nonquarantined counties. Several counties had extremely good responses to news articles and control demonstrations on the impact of correct pesticide treatments. One agent attended the National Imported Fire Ant Research Conference in Athens, Georgia, to present results of their work. Another agent presented a paper about his county's fire ant education and abatement program and won the National Association of County Agriculture Agents Achievement Award in recognition of excellence in the Urban Responsible Use of Pesticides Program.

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.

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.

Public meetings throughout the state and fire ant educational displays at public venues such as the Little Rock Flower and Garden Show are important to reaching people, also. People need to see and hear first hand 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 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 Ashley, Faulkner, Grant, Saline, Nevada and Sebastian counties.

Extension Program Results and Accomplishments

Output Indicators

8	Number of educational publications (multi-state) and materials produced including videos, CD-ROMs, slide sets necessary to conduct the statewide fire ant educational program.
200	Number of educational meetings and seminars held to inform homeowners, grower groups, community leaders and elected officials, and specialized groups about imported fire ant biology, impact and management.
30	Number of fire ant educational programs in public schools
30	Number of fire ant abatement demonstrations in residential, agricultural and public industrial areas.
40	Number of television, radio and internet programs to increase fire ant awareness.
7,000	Number of people attending educational meetings, programs and seminars

Outcome Indicators

- 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 prove 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, Federal Smith Lever CES

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. Materials are distributed on a request basis, and through in-service training.

Scope of Program – A majority of Arkansas' 75 counties have delivered this program; however, approximately 45 use it regularly.

Programs of Excellence

Fire Ant Research and Education

White County Agents Wins National Award for Fire Ant Educational Program

General Program Information – Brian Haller, county Extension agent – agriculture, received national recognition from the National Association of County Agents with a fire ant education program developed in White County, Arkansas. In 1997 fire ants were found in White County, located approximately 60 miles north of the known fire ant range. Through a strong educational effort, Haller has significantly increased the awareness of fire ant management options to residents of a county outside of a quarantine who were unaware of the presence of fire ants in their communities. Through persistence and the support of his county office in making fire ants a priority program, White County residents come to the county extension office with their fire ant questions. Programs with the White County road maintenance crews, general public meetings, quorum court meetings and

demonstrations at the county fairgrounds are just a few of the efforts undertaken by Haller.

Names of Counties or Locations Involved – Searcy, Beebe and Bald Knob

Contact Person: Donna Shanklin, Extension Entomologist-Fire Ants, 870460-1893, shanklin@uamont.edu; Brian Haller, County Extension Agent - Agriculture, 501-268-5394, bhaller@uaex.edu

Program Response: Forestry Best Management Practices

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

Situation

As with other land management practices, forest management can have an impact on water quality, quantity, aesthetic and wildlife values. Sustainable forest management practices can enhance these environmental qualities. One of the most important issues is protecting water quality. In response, the Arkansas Forestry Commission (AFC) recently released an updated Best Management Practices (BMP) Manual and monitors BMP implementation across the state. Best Management Practices are tools and guidelines used to protect and conserve water quality. These practices are voluntary and promulgated by the State Forest Commission. Riparian or stream side management is one method available to landowners for stream side protection and wildlife habitat enhancement. According the AFC, overall BMP implementation is relatively high with 80 percent of all sites surveyed employing some type of BMP. Of these, nonindustrial private forest landowners rated the lowest and the federal government the highest. Nonindustrial private forest landowners are often unaware of or do not understand Best Management Practices in Forestry.

Stakeholder Input

Stakeholder input is received from numerous sources including forest product industry representatives, landowners, NRCS, the Arkansas Forestry Commission and other interested stakeholders.

Extension Program Results and Accomplishments

Output Indicators

130 Number of newly printed and revised BMP manuals distributed to county Extension offices and forest landowners.

Outcome Indicators

80% percent compliance with all BMPs on all harvested properties.

Source of Funding

Arkansas Soil and Water Commission Project 1100

Scope of Impact

Dissemination – The guidelines were disseminated statewide after publication and made available on the web. Fact sheets will also be developed for landowners from the BMP guideline book.

Scope of Program – The new guidelines were presented to the Forestry Division of the Arkansas Farm Bureau and to a forest landowner education workshop in Van Buren County.

Program Response: Improved Efficiency in Crop Management Through Nematode Control

Contact: Terry Kirkpatrick, Nematology - Cotton and Soybean Specialist, 870-777-8441, 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 of the soybean cyst nematode (SCN). This pathogen of soybean infests an estimated 70 percent of Arkansas soybean fields and is capable of lowering yield by as much as 50 percent if left unmanaged. The development of effective resistant soybean cultivars and the popularity of cropping systems that include both rice (a non-host for SCN) and soybean in rotation has been relatively effective historically in maintaining SCN population densities in many fields below economically damaging levels. However, in 2001, SCN was widespread and severe throughout the state, and particularly on the Grand Prairie in east central Arkansas where many of our soybeans are grown.

Stakeholder Input

A task force/planning committee was organized in May, 2001, to determine what to do. This committee was made up of Arkansas Cooperative Extension Service plant pathology and agronomy specialists, the Cooperative Extension Service IPM coordinator, the University of Arkansas - Fayetteville plant pathology department head, University of Arkansas - Fayetteville nematologists and selected Cooperative Extension Service agricultural agents from within the most severely affected regions.

Overview

Initial investigations revealed that the nematode was causing significant damage to previously effective SCN-resistant soybean cultivars, and the damage was especially evident in fields that had rice in their recent cropping history. Because of the widespread nature and unusually high severity of this situation, investigations were initiated to determine the causes and to develop some strategies for more effective management of SCN for our growers.

Of initial importance was an evaluation of why our best SCN-resistant cultivars, particularly when grown in rotation with rice, were so heavily damaged. Since SCN can occur as one of 16 possible races or biotypes, each with a unique ability to parasitize specific (but different) types of soybean resistance, a collection/survey was initiated to characterize the pathogenic variability of the SCN populations that were causing the problem. With the help of local Cooperative Extension Service agents, 195 individual populations of SCN were collected throughout the major soybean production areas of the state during June and July. Cropping history of the field, current soybean cultivar being grown in the field and severity of the damage were recorded for each sample. The SCN populations in each field were then assayed under controlled conditions for race determination. Results of the survey indicate that those SCN races that have historically been commonly found in the state (races 3, 9 and 14) were virtually nonexistent in the problem fields encountered in 2001. Instead, the majority (>90 percent of the populations that were collected) were identified as either race 2, race 5 or race 6. This is an indication that the SCN-resistant soybean cultivars that are currently available and have been our primary means of minimizing crop losses will not be effective against the SCN genotypes (populations) that are now widely distributed throughout the major soybean production areas of our state.

A second aspect of this project was to focus attention on the emerging problem and to warn soybean industry leaders and soybean breeders of the potential for major crop losses in future crops. A day-long information exchange and tour was organized to view some of the problems and to share information and suggestions as to how to manage this problem. The tour, held on July 30, 2001, was hosted by the Cooperative Extension Service plant pathology and agronomy specialists and attended by approximately 60 soybean industry leaders, including both public and private soybean breeders and plant pathologists, seed dealers and

unit leaders from various laboratories across the Mid-South.

Extension Program Results and Accomplishments

Output Indicators

60 Soybean industry leaders (including both public and private soybean breeders and plant pathologists, seed dealers and unit leaders from various laboratories across the Mid-South) who attended the day-long training and information exchange regarding the emerging SCN problem.

20 Educational meetings.

– Processed 6,200 samples through laboratory last year.

– Nematode laboratory has processed approximately 4,000 samples in the past year.

Outcome Indicators

– Greater than 90 percent of the SCN populations that were collected were identified as either race 2, 5 or 6.

– Increased awareness of soybean nematode problems has focused public and private soybean breeders' attention on a major weakness in currently available cultivars, and has prompted increased activity in incorporating resistance to races 2, 5 and 6 in future cultivars.

– Laboratory provides rice white tip nematode assay that enables producers to ship rice to countries that have a quarantine on this pest, thus expanding market potential of Arkansas rice.

Source of Funds

This work has been supported through soft funding from various Cooperative Extension Service specialists, state funds and the Cooperative Extension Service IPM program.

Scope of Impact

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 across the Mid-South through an information exchange session and through printed materials.

Scope of Program – The nematode diagnostic program is utilized statewide by producers of all crops and internationally by USDA and government to certify grain and other commodities.

Program Response: Integrated Pest Management (IPM) Research and Production Efficiency

Contact: Clifford M. Coker, Extension Plant Pathologist, SEREC, Monticello, AR, 870-460-1091, Pest Management

Situation

The goals of the University of Arkansas Cooperative Extension Service specialists are to serve as a primary source of unbiased, technologically-sound, research-based information for our clientele; to strengthen and use our county-based educational system; and to strengthen the image of Extension's agriculture programs. Primary responsibilities as Extension plant pathologist are in education and applied research. In cooperation with the research scientists, the Extension plant pathologist and other Extension specialists, assistance is provided for planning, initiating, coordinating, conducting, implementing and evaluating interdisciplinary educational training in all aspects of plant pathology.

Since Arkansas' commercial agriculture consists of intensively managed crops – requiring timely irrigation, fertilizer and pesticide applications – Integrated Pest Management (IPM) is a necessary and natural tool to help producers farm more efficiently while reducing the pesticide risk to the agriculture ecosystem.

Stakeholder Input

Clientele including producers, county agents and Extension specialists provide regular input concerning the critical issues they are facing related to research and production needs, which are addressed through the IPM program.

Overview

Priorities for the IPM program have historically been to provide the best research-based, up-to-date recommendations for use by our clientele. IPM goals this past year have been to ensure that Arkansas producers are at the forefront of plant disease management. This involved keeping county Extension agents and producers abreast of new technology, such as precision agriculture and the economic use of GMO crops. While these programs are important, it is also important to maintain continuity in educational activities that focus on best management practices, which often rely upon accurate pest identification.

Priorities for the next few years will be to educate producers concerning plant disease identification and disease management through the use of distance diagnosis, developing Extension publications, increasing efficiency of program funding and continued IPM efforts.

Extension Program Results and Accomplishments

Output Indicators

20 Number of planning meetings/sessions pertaining to plant pathology issues.

34 Number of training sessions for county agents, consultants and producers.

1,720 Number of requests for information pertaining to plant pathology issues.

1,513 Attendance at 40 workshops involving soybean IPM.

811 Number of field visits in response to agents or producers pertaining to plant pathology.

41 Number of presentations at training sessions pertaining to plant pathology issues.

1,028 Soybean producers - IPM meeting attendance.

4,741 Growers receiving newsletters on soybean IPM.

213 Popular press articles including radio, TV and newspaper.

7,761 Number of soil samples collected representing 309,524 acres pertaining to plant pathology.

10,000 Number of test plots pertaining to soybean plant pathology.

Outcome Indicators

21 Number of counties participating in third year of Soybean IPM program.

131 Number of field demonstrations in third year of Soybean IPM program.

Source of Funds

Smith-Lever 3d IPM funds, Promotion Board funds, grants and gifts (various crop protection companies), FLS-CES.

Scope of Impact

Dissemination – Soybean IPM programs are available to all counties where a need exists to manage pests in a more efficient way. Program information is available through printed materials available through the county offices and at training meetings, "hands-on" presentations, field days, as well as available through the Extension web site.

Scope of Program – All Arkansas row crop counties.

Program Response: Management of Stink Bug in Cotton

Contact: Jeremy Greene @ 870-460-1091, Pest Management

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 be of great importance as an educational program.

Extension Program Results and Accomplishments

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. Developing and validating 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 need information concerning the efficacies 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.

Output Indicators

35 Number of educational meetings held with industry representatives, state and federal agency personnel and University of Arkansas research faculty to identify and discuss insect management issues.

16 Number of training meetings conducted for agents and producers.

– Extension publications on stink bug identification – fact sheet (FSA7058) and laminated handout.

Outcome Indicators

– Written recommendations produced concerning insecticide control of stink bugs in cotton in MP144.

Source of Funds

Greene, J. K. 2002. Evaluation of insecticides for control of stink bugs. Cotton Incorporated – CORE-funded project. $8,000. Principal Investigator.

Greene, J. K., D. R. Johnson, J. D. Hopkins, G. Lorenz and W. Robertson. 2002. Validation of Boll Injury Thresholds for Stink Bugs in Cotton. Cotton Incorporated – state-supported project. $15,500 annually for 3 years.

University of Arkansas CES FSL and IPM funds.

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, Lincoln and St. Francis. Some producers in these counties implemented the management plan during 2002, and many more will adopt it for 2003, following additional trainings and meetings.

Program Response: Management of Stink Bug in Rice

Contact: Donald R. Johnson, Extension Entomologist, 501-671-2229, Pest Management

Situation

The occurrence and population levels of the rice stink bug and other stink bugs have increased throughout the state over the last 2 to 3 years. Many factors may contribute to make environmental conditions favorable to population increases. These may include thriving populations of grass hosts growing wild along roadsides and field margins, incomplete control of grass hosts such as barnyard grass, broadleaf signalgrass, and several others within rice fields, and a possible decline in natural control agents such as parasites and predators. The rice stink bug has several known natural enemies including the egg parasite, *Telenomus podisi*, that has a major role in control and two parasitic flies that have a minor role in control. Insecticides in rice will certainly disrupt the role of these biological agents in control of the rice stink bug. The role of insecticides in outbreaks of rice stink bug may be difficult to verify. However, the parasite levels in fields may be used as an indicator of insecticide impact on beneficial insects in rice fields. A survey of parasitism levels in different rice production areas was conducted to determine occurrence and density of the parasite.

Rice is grown on 1.4 million acres in Arkansas each year with an average yield of 6,000 pounds per acre. Farm value of this production varies from $500,000,000 to $750,000,000 per year depending on market prices. The control of rice stink bugs has created many questions this past year as a result of the losses to stink bug in 2001. Losses as a result of rice stink bug damage alone in 2001 were estimated to be approximately $17 per acre, or roughly 23.8 million dollars.

Stakeholder Input

Industry, producers, county agents and Extension specialists recognized the importance of rice stink

bug management and provided guidance on approaches to management of rice stink bug. During the summer of 2001, the rice stink bug problem was pointed out by county agents, specialists and consultants. Additional attention was drawn to the rice stink bug problem when industry representatives from Riceland, Producers, Busch and others expressed concerns to the Division of Agriculture about the low quality of the crop as a result of rice stink bug damage. As a result, a plan was devised to educate and make the producers of Arkansas aware of the need of scouting and proper management of rice stink bug in rice.

Overview

Rice stink bugs continue to be a threat to the rice industry and infest rice in differing degrees each year. The infestations are of concern to rice producers because of the obvious expense and loss of revenue due to low quality created by rice stink bug feeding on kernels of rice in the field. The problem must be addressed by grower understanding of the biology and control of the insect. A thorough understanding of scouting, monitoring techniques and insecticide performance is required for growers to manage rice stink bug. In addition, an extensive Extension and research program designed to develop biological and cultural controls of rice stink bugs is necessary in addition to traditional insecticide control methods.

Extension Program Results and Accomplishments

Output Indicators

2,500 Growers, consultants and other clientele attended meeting where information was presented.

1,200 Phone calls were accepted by personnel.

– Numerous field visits were made to address rice stink bug problems.

11 Field demonstrations on stink bug control involving

2 Agents and consultants.

25 Counties participated in Rice IPM programs.

– Popular press articles were released and utilized by numerous outlets.

Outcome Indicators

– Rice stink bug damage was maintained at a low level and no damage noted in 2002 compared to a 23.8 million dollar loss in 2001.

– Insecticide costs were based on scouting and rice stink bug populations.

– Reduced rates of insecticides will be used in the future as a result of demonstrations.

Source of Funds

Efforts for education on rice stink bugs were funded by grants from the Arkansas Rice Research and Promotion Board, gifts from various crop protection companies and FSL-CES budgets.

Scope of Impact

Dissemination – The rice insect situation in 2002 was not as intense as the previous year. Rice was infested by rice stink bug but not to the extent as seen in 2001. Overall, the rice stink bug educational effort involved many county meetings, several news articles and approximately 11 county stink bug management demonstrations. Many producers were interested in purchasing sweep nets for sampling rice stink bugs. County Extension agents trained producers and stressed rice stink bugs as a problem. A fact sheet was developed on rice stink bug that was distributed to agents and placed on the Extension web site. A weekly newsletter also included several articles on rice stink bug that stressed control measures and sampling. In addition, over 200 consultants and agri-business personnel were trained at the annual consultants training meeting.

The county demonstrations resulted in a significant shift to using Karate and Fury as the insecticide of choice. Karate and Fury were shown to maintain control for a longer period of time and did not have a population rebound as observed with the standard

methyl parathion. In tests, Karate was shown to perform at lower rates, and next year the demonstration effort will be directed toward using lower rates of Karate and Mustang Max (new Fury).

Scope of Program – Educational meetings were in all rice producing counties as a part of the rice education effort. Public awareness newsletters, popular press articles and facts sheets were developed to stress rice stink bug management for 2002. In addition, 11 counties conducted rice stink bug management demonstrations. Rice IPM programs are conducted in 25 Arkansas counties.

Program Response: Oak Sustainability

Contacts: Tamara Walkingstick, Ph.D., Extension Specialist - Forestry, 501-671-2197, twalkingstick@uaex.edu; Becky McPeake, Ph.D., Extension Specialist - Wildlife, Environment & Natural Resources; rmcpeake@uaex.edu; Caroll Guffey; Extension Instructor, 870-460-1549; guffey@uamont.edu

Situation

Several years of drought, overcrowding, poor soils, inadequate management, insect damage and declining vigor are severely affecting the oak forests of the National Forest system beginning in 1999. The U.S. Forest Service estimates that more than 300,000 acres are affected by this combination of factors. One of the most significant factors is the red oak borer. Under "normal" circumstances, one or two red oak borer attacks per tree are common. Under the current circumstances, 500 to 600 red oak borer larvae per tree are killing the trees. Although the most severe outbreaks have occurred on National Forest lands, evidence suggests that the red oak borer occurs statewide and could present a threat to private forest lands in the future.

Stakeholder Input

The Natural Resource management community is collecting stakeholder input and responding to this serious situation through informational tours for professionals, a web site and a state-wide symposium focused on upland oak ecology and sustainability.

Extension Program Results and Accomplishments

Output Indicators

450	Number of 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 University of Arkansas Cooperative Extension faculty to identify forest landowner education issues and plan education programs.
4	Number of UACES landowner education meetings conducted that included information concerning red oak borers.
1	Number of UACES fact sheets developed
2	Number of radio programs conducted with the Arkansas Ag. Network

Outcome Indicators

– Plans and programs in response to the situation are currently underway.

Source of Funds

Smith Lever 3b & 3c, USDA Forest Service, AG&FC; USDA Forest Service, NRCS, Arkansas Forest Resources Center, UA-Fayetteville

Scope of Impact

Dissemination and Scope of Program – Statewide distribution of red oak borer information via web and inter-net to all county offices. Fact sheet about red oak borer developed in collaboration with Pest Management section, and the AFC. Newspaper article written about the red oak borer.

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.

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/noncommercial applicators.

Private applicators must be retrained every five years while commercial/noncommercial applicators are retrained every three years.

The training sessions for both groups last approximately 3-4 hours. The sessions include information on spray drift management, pesticide labeling, safety precautions, first aid, protective gear, storage, handling, disposal, integrated pest management, environmental concerns, application equipment and calibration, groundwater protection, heat stress management, pesticide recordkeeping and nitrogen management.

Extension Program Results and Accomplishments

Output Indicators

15	Educational publications, slide sets, study guides and other materials were produced as needed to conduct the program.
91	Educational meetings were held to certify or recertify commercial and private applicators.
5,079	Individuals attended pesticide educational programs.

Outcome Indicators

1,244	Commercial applicators were certified and recertified.
3,835	Private applicators were certified and recertified.

Source of Funds

Smith Lever 3b and 3c

Scope of Impact

Dissemination – All private and commercial/ noncommercial pesticide applicators in Arkansas. Certification and recertification pesticide applicator training sessions are also open to the public.

Scope of Program – All counties in the state.

Program Response: Plant Disease Detection and Diagnosis

Contact: S. R. Vann, Ph.D., Extension Plant Pathologist, Pest Management Section, 501-676-3124 (office) or 501-944-0857 (cell), Plant Disease Clinic, 2201 Highway 70 East, Lonoke, AR 272086, svann@uaex.edu

Situation

Plant diseases affect the quality and profitability of all agricultural crops grown in Arkansas. Rapid identification of significant diseases will allow growers and other clientele to make appropriate management decisions to maximize yield, quality and aesthetic value of all commodity groups. Both existing and newly emerging plant diseases will require cutting edge technology and technical expertise in those fast growing commodities that impact the overall economy of Arkansas.

Stakeholder Input

Stakeholder input relating to the operation of the Plant Disease Clinic is solicited through county Extension education programs and county Extension agents throughout the entire state on an annual basis. Routine surveys seeking input from participants of the Master Gardener program are also conducted in order to customize training for those individuals. Input from these stakeholders is used to implement objectives for county Extension educational programs.

County Extension agent feedback is collected continually from all geographic districts of the state as well as industry personnel, agricultural professionals and colleagues.

Feedback from agricultural professionals in the turf and ornamental sector provide input for training purposes for other industry clientele.

Input from state and federal agencies such as APHIS/USDA aid in program customization.

Overview

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 1.5 million acres of rice, 800,000 acres of wheat, 930,000 acres of cotton and 2.4 million acres of soybeans harvested in 2002, Arkansas produces a significant portion of field-grown food and fiber in the United States. As a result of September 11, a new awareness of bioterrorism 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 Extensions agents and other "first responders" such as Master Gardeners in the detection and identification of plant disease which may potentially be harmful to our food crops. 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

50	Multi-county Master Gardener disease related training presentations.
1,453	Total plant samples (to date) examined into the Plant Disease Clinic. (Number of samples have remained 4-fold for the past 5 years over the original number of samples.)
550	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.

8 Timely disease related news articles in print media.

– Radio interview with Janet Carson.

Outcome Indicators

– Sample numbers from turf and ornamental sectors 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.

– The clinic has been selected to become a portion of the Southern Plant Detection Network for plant pathogens that may pose a potential bioterrorism 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, Golf Course Resort Gift

Scope of Impact

Dissemination – A Plant Disease Clinic web page in available on the University of Arkansas Extension web site. Relevant publications in 2002 included MP154, *Plant Disease Control Product Guide for Arkansas*; FSA7530, *Black Spot of Rose*; FSA7525, *Daylily Rust*; FSA7527, *Rhizoctonia Large Patch Disease of Zoysiagrass and Bermudagrass*; FSA7529, *Control Root Knot Nematodes in Your Garden*. Handouts were prepared relating to sample collection and plant disease references for all major commodity crops in Arkansas. Larger numbers of digital images also being examined by the principal diagnostician.

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.

Program Response: Rangeland and Pasture Management

Contact: John Boyd, Weed Science Specialist, 479-575-6244, Pest Management

Situation

Growing high quality bermudagrass hay for sale to horse owners and other groups that demand weed free hay has become an important agricultural enterprise in Arkansas. It has, in many cases, replaced soybeans or other traditional row crops. Infestation of bermudagrass hay and pasture with sandbur renders it useless for animal consumption.

Stakeholder Input

The Arkansas Cattlemen's Association, the Arkansas Forage and Grassland Council, the Arkansas Farm Bureau and hundreds of farmers and county agents have identified sandbur control in bermudagrass forage as a major obstacle to profitable production of bermudagrass hay and pasture.

Overview

Experiments were conducted on a privately owned, sandbur infested common bermudagrass field near Dardanelle in Yell County to determine the most effective approach to sandbur control. We conducted three replicated herbicide trials with two pasture herbicides to evaluate their effectiveness for sandbur control and the potential for crop injury.. Two trials were initiated at the seed head growth stage and the third was conducted on bermudagrass and sandbur stubble one week after hay cutting. Roundup (glyphosate) proved to be ineffective for sandbur control under these conditions. Plateau (imazapic) was evaluated at 2, 3, 4 and 6 fluid ounces per acre. The lower rates provided up to 85 percent control; however, this is inadequate in the case of sandbur. Our data showed that the 6 fluid ounce rate is needed for acceptable control of sandbur in the seedhead and stubble stage of growth. Plateau caused 30 to 50 percent stunting of bermudagrass for up to six weeks after application.

While undesirable, farmers will tolerate this level of injury to control sandburs.

Extension Program Results and Accomplishments

Output Indicators

– Producers were able to manage sandbur in bermudagrass pastures with confidence that sandbur could be controlled.

Outcome Indicators

– The data resulting from this research gives Arkansas bermudagrass forage farmers a reasonably priced tool ($12 per acre) for controlling sandbur and bringing otherwise useless acres into production.

Source of Funds

Federal Smith Lever funds and a grant from BASF chemical company.

Scope of Impact

Dissemination – This data was presented at and published in the abstracts of the Arkansas Crop Protection Association Meeting and 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 counties in Arkansas.

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 producer of rice in the U.S., averaging 1.5 million acres per year. Due to the nature of commercial rice production and the growing environment in the state, rice also receives a large share of the fertilizer and pesticide applications made in Arkansas annually. The economics of rice production since 1970 and the varieties grown have encouraged heavier, more frequent and preventative applications of nitrogen fertilizers and pesticides to achieve the highest yield possible. However, it has been shown by research that high yields can be achieved on most soils with moderate fertilization. Also, weeds, insects and diseases in the rice crop are more efficiently controlled with pesticides if scouting and decision thresholds are used or, in some cases, if rates lower than labeled rates are applied. Additionally, research has demonstrated that good cultural practices can consistently minimize pest problems and the need for heavy and frequent pesticide applications. The Rice IPM Education Program was initiated in 1998 to encourage increased adoption of integrated pest management principles with respect to Arkansas rice production. To achieve its goals, the program provides funding and other support to county Extension agents through a grant system, and all major rice counties have consistently participated.

Stakeholder Input

Input is solicited from county agents and County Extension Councils 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 the many facets of the IPM program, whether the DD50 system for growing rice or a reduced-rate fungicide demonstration. Since the start of the program, many more rice producers have experienced "hands-on" Rice IPM education on their farms.

Overview

The Rice IPM Program provides grant funds to counties that develop and implement local 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 in the proposal and reviews the annual report from each Rice IPM county for the previous year. Grant funds have been used to support Rice IPM related travel, Rice IPM specific equipment items, Rice IPM newsletter printing and mailing, and so forth.

Extension Program Results and Accomplishments

Output Indicators

22 Number of Rice IPM County Programs.

40 Grower meetings in Arkansas featuring Rice IPM.

2,268 Stakeholders attending meetings/field days with IPM featured.

190 Field demonstrations funded by the Rice IPM program.

53 Field meetings, field days and workshops featuring Rice IPM.

153 Crop newsletters featuring Rice IPM.

5,907 Stakeholders receiving newsletters featuring Rice IPM.

167 Popular press articles, radio spots and interviews featuring Rice IPM.

492,038 Rice acres soil sampled in Rice IPM counties.

1,965 Farms enrolled in the Rice DD50 program in Rice IPM counties.

755,406 Rice DD50 acres in Rice IPM counties

85 Pesticide applicators trained in Rice IPM counties.

1,931 Rice acres enrolled in 4-H Rice for Ducks program in Rice IPM counties.

Outcome Indicators

- Number of counties participating in the Rice IPM program average 20-25 each year with consistent participants tending to increase their program effort over time. For example, counties in the Intermediate Program levels have increased while counties with Basic Programs have decreased since 1998.

- Rice DD50 and soil sampling acreage have increased since the county Rice IPM programs started encouraging more use of these management tools.

- The number of field demonstrations, field tours, workshops and newsletters have all dramatically increased in Rice IPM counties since start of the program in 1998.

- Fungicide usage has decreased on a per acre basis since 1998 with the average rate of Quadris fungicide falling from 12.8 fluid ounces per acre in 1998 to 8.5 fluid ounces per acre in 2001. Usage of the propiconazole fungicides has changed greatly as well, with high rates (10 fluid ounces per acre) discontinued and adoption of 4-6 fluid ounce rates. Research showed the latter fungicide to be ineffective on sheath blight at the 10 fluid ounce rate but effective in preventing kernel smut at the 4-6 fluid ounce rate if applied at the right timing. Propiconazole rates thus fell about 50 percent on a per acre basis during the life of the Rice IPM Program.

- Timely scouting and application of pesticides have been improved by weekly newsletters at both the

state and county levels during the rice growing season, maximizing pesticide efficiency.

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 office staff apply 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, Pest Management Newsletter (University of Arkansas Cooperative Extension Service Pest Management Section, Little Rock, 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, Jefferson, Lafayette, Lawrence, Lincoln, Lonoke, Mississippi, Monroe, Poinsett, Prairie, St. Francis, White and Woodruff. These 22 counties include the largest rice production counties in the state and represent more than 85 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; Cliff Coker, Extension Plant Pathologist, Pest Management, 870-460-1091

Situation

Soybean production in Arkansas was 96,192,000 bushels on 2.88 million acres, the second smallest crop in recent history. This year's 2.88 million acres was slightly below the trend of the 1990s, as the soybean acreage in the state averaged 3.34 million acres during 1996-2000, ranking Arkansas as the ninth largest soybean producing state in the U.S. However, the average yield of 34 bushels per acre tied the highest recorded yield, which was set in 1994. 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 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 16 top soybean counties, representing 59% of Arkansas soybean acreage.

26 Soybean meetings featuring IPM during 2002.

1,371 Meeting attendance by soybean producers, about 40% of Arkansas soybean farmers.

107 Field demonstrations conducted by participating county agents related to integrated pest management of soybean, including:
   a. Balanced soybean fertility and effect on yield and pest severity.
   b. Effect of proper irrigation on soybean productivity and disease management.

– Multiple management approaches to weed control in soybean.

– Use of lower rates of seed treatments to evaluate seedling disease management.

– Appropriate use of fungicides to minimize foliar disease.

– Use of disease resistance in soybean production in Arkansas.

– Nematode sampling to identify and improve nematode management in problem fields.

– Reduced use of pesticides through scouting and decision thresholds.

– Monitoring soybean leaf beetles and stink bugs in soybean.

– Monitoring soybean diseases in Arkansas.

– Participating counties held 44 workshops or field tours featuring IPM, with 1,263 attendees.

– County participants wrote or distributed 97 newsletters on soybean and soybean IPM, with 4,301 growers receiving each of them.

– Soybean IPM topics were featured in 127 popular press items among the participating counties, including radio and TV programs and newspaper articles.

– Participating counties reported at least 3,835 private and 1,244 commercial pesticide applicators received IPM training.

Outcome Indicators

– 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 8,905 soybean soil samples collected and analyzed by the University of Arkansas, representing 355,409 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 also reported using the pest management tools a) nematode sampling: 279 fields covering 12,743 acres and b) soybean variety selection computer program – SOYVA: 742 fields for 124,789 acres. This program provides better variety choices based on nematode and disease problems as well as herbicide tolerance.

Source of Funds

Smith-Lever 3d IPM funds, grants (Arkansas Soybean Promotion Board), gifts (various crop protection companies), 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 six 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 16 counties during 2001. Soybean IPM county participation has held steady at 16 counties with $12,000 distributed in county IPM grants.

Program Response: Urban Forest Management

Contact: Tamara Walkingstick, Ph.D., Extension Specialist - Forestry, 501-671-2346, Caroll Guffey, Extension Instructor - Forestry, University of Arkansas - Monticello, 870-460-1549, Environmental and Natural Resources

Situation

Forestry entails more than timber stand management. Forestry also includes managing trees in the urban and community setting. Insects, disease, natural disasters and urban sprawl all impact trees in community settings. The most significant needs include:

- Response to Natural Disasters: Natural disasters are common in Arkansas and include ice and wind storms, tornadoes and wildfire. 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. Homes have been destroyed in the past from wildfire, and the current fuel levels create concern.

- Urban Tree Care: Trees are important in the community and urban landscape. However, few homeowners understand urban tree selection, maintenance and care.

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.

Overview

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.

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. Homeowners also have limited knowledge about tree care.

Extension Program Results and Accomplishments

Output Indicators

150 Number of homeowners, agency personnel and government officials attending educational programs.

2 Number of educational meetings conducted for different homeowner groups, Master Gardeners, arborists and the public concerning damage to trees and wildlife at the urban-rural interface.

3 Number of educational programs held focusing upon urban tree care and urban forestry concepts.

50 Number of homeowners, Master Gardeners, arborists or the general public attending programs.

Outcome Indicators

30 Number of professional tree care providers who express an increased understanding of urban forestry planning.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – Articles about ice and wind damage to urban trees received statewide coverage in local newspapers. Article on wildfire at the urban-rural interface published in two statewide organization newsletters. Information was available via the web.

Program Response: Urban Pest Management and West Nile Virus

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, as well as adversely impact property values and the quality of life.

West Nile Virus (WNV) is a mosquito borne arbovirus that was first recognized in the western hemisphere during the summer of 1999 (NewYork). By the end of 2001, WNV had been detected in the bird population in Arkansas through statewide surveillance measures; however, no human cases of WNV were recorded. During 2002, WNV became epidemic in the United States resulting in the largest arboviral meningeoencephalitis epidemic ever documented in the western hemisphere, On a worldwide basis, the epidemic was also the largest reported West Nile meningeoencephalitis epidemic ever recorded. The number of laboratory positive human cases of WNV that occurred in Arkansas during 2002 has reached 42 with two deaths recorded.

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. The magnitude of the individual investment warrants that termite control measures be applied by properly trained and regulated professionals. 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. A single colony of Formosan subterranean termites may contain several million termites compared to several hundred thousand termites for native subterranean termite species. A single individual Formosan

subterranean termite doesn't consume more wood than a single native subterranean termite; however, because of its large population size, a Formosan subterranean termite colony can cause more structural damage in a shorter period of time. 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.

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 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

A need for planning and implementation of Urban IPM programs was identified by the Cooperative Extension Service resulting in an Extension Urban Entomology position being initiated July 1, 2002.

The Governor identified a need to implement measures to mitigate the threat of mosquito-borne disease, particularly WNV, in Arkansas. All Arkansas counties in cooperation with the Cooperative Extension Service, the State Plant Board and the Arkansas Department of Health developed mosquito abatement plans for implementation in 2002 and 2003 to qualify for a share of funds made available by the Governor.

The Arkansas State Plant Board identified a need to update educational and training materials for individuals seeking commercial/noncommercial pesticide applicator certification in the areas of Termite and Structural Pest Control, Household Pest and Rodent Control, Ornamental Tree and Turf Pest Control, Weed Control, Golf Course Pest Control, Food Related Pest Control and General Fumigation.

Overview

Mosquitoes are among the most common pests of people and their biting habits can cause them to be an extreme nuisance. Mosquitoes can also vector numerous diseases that affect humans and their pets or livestock. Five types of encephalitis – St Louis encephalitis (SLE), eastern equine encephalitis (EEE), West Nile Encephalitis (WNE), Venezuelan equine encephalitis (VEE) and western equine encephalitis (WEE) – have occurred in the state and can be transmitted by mosquitoes to humans. Although, disease transmission is the most commonly cited reason for considering mosquitoes to be a public health problem, the presence of large numbers of biting pests will influence the physical and mental well being of most people. Mosquitoes also cause economic loss to livestock as a result of blood loss and irritation. In addition, mosquitoes can reduce recreation activities that can result in a loss of tourist income, and they can depress property values on land adjacent to areas where they breed. With the onset of the WNV epidemic, Arkansas counties requires educational and technical assistance. A collaborative effort among the Cooperative Extension Service, Arkansas Department of Health and Arkansas State Plant Board was made to address the situation.

Termites are considered the most economically important wood-destroying organism in the United States. Subterranean termites cause more damage to homes than all other natural disasters combined. In the U.S., economic loss to property owners due to subterranean termite activity amounts to greater than three billion dollars annually. This includes the cost of control measures and the cost of repairing structural damage. A collaborative effort between the Cooperative Extension Service and the Arkansas State Plant Board to update educational and training materials for licensing commercial pest management professionals was initiated to address this situation.

Extension Program Results and Accomplishments

Output Indicators

565 Individuals attending presentations.

180 Phone contacts from individuals seeking pest information.

12 Presentations at educational meetings

75 Counties participating in Mosquito abatement program.

32 Press articles or media interviews.

6 Major Extension publications.

2 Presentations at professional meetings.

4 Youth outreach educational activities.

Outcome Indicators

– Number of human cases with West Nile Virus held to 42.

– Awareness of Formosan subterranean termite increased and state remains infestation free.

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 a mosquito larval abatement program. Through publications and training, counties have implemented very successful programs and are excellent contacts for program development consultation.

Program Response: Weed Management in Arkansas Crops

Contact: Robert Scott, 501-837-0273 or 501-676-3124, Pest Management, bscott@uaex.edu

Situation

Crop losses due to weeds can exceed $500 million annually. Herbicide technology for the control of these weeds continues to change and evolve. The addition of herbicide tolerant crops to the mix of technologies that are available to producers has only increased the number of different options available to growers today. While these new options are all valuable tools for producers to choose from, knowing which programs are the best for their particular farm can be confusing. Also, as new technologies emerge, certain products have to potential to solve emerging or long-term weed control issues under the state's section 18 and 24C label options. Weed control work is focused on evaluating new herbicide technologies and their potential fit in the production practices used in the state of Arkansas.

Stakeholder Input

All crops grown in Arkansas receive some form of weed control. County committees, promotion boards and growers always identify weed control as a major issue effecting crop production and a major area of educational focus.

Grower feedback is collected at each county meeting. Continuous feedback on current needs in the state is provided by county agents. Regular meetings with leaders in the herbicide development industry provides input on new products. These industry contacts also establish studies to evaluate the new technologies in this program. In addition, numerous meetings are attended each year to seek input from other weed scientists on current trends and new products. The various promotion boards, which help fund this research, also provide valuable feedback.

Stakeholders are row crop and wheat farmers in the State of Arkansas. Other stakeholders include

agricultural professionals with concerns or interest in weed control programs for Arkansas. These individuals are identified through the county agent system and through contacts made by attending professional and trade organizational meetings. Also, by the publication of Extension bulletins and popular press articles.

Feedback from growers, promotion board members and county agents is used to develop weed control programs that best represent the needs of the majority of producers. In many circumstances if it were not for this program, producers would have only the recommendation of industry representatives to rely on. This feedback is considered on an on-going basis as county meetings, promotion board meetings and meetings with industry representatives take place. Valuable input for this program is also obtained by attending meetings, such as, the Arkansas Crop Management Conference, the Delta Weed Workers Informal Get Together, the Southern Weed Science Society annual meeting and the annual meeting of the Weed Science Society of America. In the case of wheat producers, our work and recommendations represent a significant amount of the total work being done for this small segment of growers in the state.

Overview

Over 7 million acres of crops are grown annually in Arkansas. This program provides growers and other agricultural professionals with weed control recommendations utilizing existing and new herbicide technologies. The focus of these recommendations is to provide the most practical and economical weed control available to assist farmers in maximizing profits on their farms. Herbicide programs are evaluated under a variety of environments and situations. Weed control costs can exceed 30 percent of the total cost of production. Reducing the cost associated with weed control helps to increase production efficiency.

Extension Program Results and Accomplishments

Output Indicators

50 Replicated field demonstrations were established in numerous counties. The MP44 publication was updated and available to growers in January of 2003. Numerous presentations have been delivered at county meetings, professional meetings and field days (+20).

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 resulted in the state of Arkansas receiving a section 24C label for the use of a new technology for rice that allows rice producers to control red rice in a growing rice crop. The “launch” year for this technology was viewed as a success and will save rice producers money in lost income from red rice competition and contaminated grain. We have taken a leadership role among other states to evaluate the use of several new technologies for rice. These include the use of Command herbicide by air and the use of Command tank-mixtures with other products applied by air.

– Although unsuccessful, data from this program was used to apply for a section 18 for a new product for use in wheat to control a biotype of Italian ryegrass that is herbicide resistant. The section 18 was not granted by the EPA; however, our research and efforts toward the section 18 have brought attention to this emerging and growing weed problem in the state. This effort has improved chances for a label next fall.

Critical points:

– 80+ county educational meetings for farmers

– Over 1,600 farmers attending county meetings

– 80% of rice acres in the state where new weed control technology was used

– 35,000 acres of rice grown with new technology for red rice control

– Savings of up to $15 dollars per acre on cotton production practices in 2001

– Savings in weed related costs from red rice and late season grass control

Source of Funds

University of Arkansas Cooperative Extension Service (Smith-Lever Act), Rice Promotion Board, Soybean Promotion Board, Wheat Promotion Board and Grants from Industry

Scope of Impact

Dissemination – This program is made available to the general public. The primary publication is the MP 44 (12,000 copies). All counties are contacted and reports are sent on request. Highlights of research findings are discussed in popular press articles (*Rice Journal*, *Delta Farm Press*, etc.), professional papers, research reports and county meetings (over 80). State experiment station field days are also utilized to disseminate information gleaned from this program.

Scope of Program – This program is state specific to Arkansas. All counties that produce rice, soybeans or wheat have disseminated information from our program in the form of the publication MP44, *Recommended Chemicals for Weed and Brush Control*. Although the program is not officially recognized as being multi-state, our recommendations are followed by many growers in Missouri, Mississippi and Louisiana.

KEY THEME: NATURAL RESOURCE MANAGEMENT

Program Response: Forestry Continuing Education

Contact: Caroll Guffey, Extension Instructor and Director Continuing Education, 870-460-1549, Arkansas Forest Resources Center.

Situation

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 six hours of Continuing Education 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 attorney, accountants, natural resource managers, county agents, 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. These individuals were identified by the program director and invited to participate in annual meetings. 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.

Extension Program Results and Accomplishments

Output Indicators

1 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 University of Arkansas Cooperative Extension faculty to identify forest continuing education issues and plan programs.

13 Number of continuing education programs conducted.

Outcome Indicators

345 Number of participants maintaining Registered Forester status

Source of Funds

Smith-Lever 3b and 3c, Arkansas Forest Resources Center.

Scope of Impact

Dissemination – Program is available statewide to all interested professionals including county and state University of Arkansas faculty.

Scope of Program – The Board of Registered Foresters recognizes this program as being the primary resource for forestry professionals to receive Continuing Education credits. The number of courses increases each year.

KEY THEME: PESTICIDE APPLICATION

Program Response: Precision Chemical Applications

Contact: Dennis R. Gardisser, Associate Department Head - Extension Engineer, 501-671-2241, Biological and Agricultural Engineering

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 150 Arkansas aircraft for both spray and granular type applications at 11 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 led the way with a section 24C label for aerial application of Command7 herbicide to rice. Aircraft in the 250,000 acres that were in this program were calibrated and certified at Extension workshops. No off target or performance resulted from the applications of Command7.

Drift reduction demonstrations were conducted at four aerial application workshops this year to help applicators determine the effects of several different operating parameters. 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.

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.

Application guidelines were developed and presented as an ongoing part of pesticide license recertification for all types of commercial and private applicators. Arkansas engineers provided leadership during the planning and conducting of a nationwide Drift Educators * PAT conference held in Sacramento, California.

Arkansas engineers have provided leadership with the "National Drift Minimization Coalition" and served as the technology co-chair for that group. 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. Much of the application technology session being presented in this program this year came from Arkansas Extension materials. This program was presented to 441 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 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. Arkansas engineers completed an EPA grant project to design and build two on-farm pesticide rinse and containment facilities in Arkansas. The plans from these facilities will be used to develop a national training guide for other programs.

Extension Program Results and Accomplishments

Output Indicators

11 Fly-ins – Aircraft calibrations for both spray and dry materials. Droplet size and potential drift evaluations.

6 Educational meetings on pesticide rinse and containment facilities.

2 Pesticide rinse and containment demonstration facilities constructed.

54 Educational meetings with applicators and producers on chemical application technology.

Outcome Indicators

1,000 Aircraft calibrations.

50 Producer and operator facilities under construction using methods and techniques illustrated in demonstration projects.

Source of Funds

FSL, user fees $100/aircraft/year, 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.

KEY THEME: RECYCLING (INCLUDING YARD WASTE/ COMPOSTING AND SOLID WASTE MANAGEMENT)

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 2.67 million tons of solid waste annually, a ton per person each year. The state has a limited number of disposal sites or landfills (23 Class 1 landfills to serve 75 counties, one was closed much of the year). Some areas of the state do not have comprehensive solid waste management collection programs. Yard trimmings are banned from landfills. Recycling goals have been set by state legislation. Improper disposal of solid waste is a health and safety problem and a detriment to economic development.

Extension Program Results and Accomplishments

Output Indicators

85 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).

83 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).

32 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).

50 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.

8,749 Number of clientele attending educational programs and receiving educational publications and other materials written and/or distributed on solid waste management.

Outcome Indicators

952 Number of clientele who reported changing their solid waste management practices.

304 Number of agriculture clientele adopting new disposal practices.

9,503,790* Number of pounds of pesticide containers and plastic irrigation pipe*

(3,100,500**) Collected for recycling Jan. 02 – Dec. 02 (**number reported by county agents)

1,146 Number of illegal dumps identified and closed. (This number was reported by county agents.)

74 Number of illegal dumps cleaned up and identified, according to the Arkansas Department of Environmental Quality, between 7/01 – 6/02.

1,148 Number of cleanup events and participation.

64 Number of groups participating in adopting streets, parks, highways, streams and similar cleanup programs.

Source of Funds

Smith-Lever 3b and 3c

Scope of Impact

Dissemination and Scope of Program – 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: Watershed Education

Contacts: Mike Daniels, (501) 671-2281, Environmental and Natural Resources; Tom Riley, Environmental and Natural Resources

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.

Stakeholder Input

Input comes 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 currently are conducting four EPA-funded watershed education projects and two CSREES-funded projects (see below):

- Watershed: 406 Regional watershed
  Funding (Fed. Only): $70,000 per year for 4 years
  Location: Statewide
  Status: In third 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: Last year
  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: Last year
  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: Last year
  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: Last year
  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*Syst.

- 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.

These projects directly support county programming by funding two full-time county agent positions (one for Ballard Creek and one for White River), one Extension instructor for Bayou Bartholomew and four program assistants (total of 2.0 FTE) for the Lower Little watershed. The educational approach is to tailor existing Extension programs such as soil testing and Farm*A*Syst and/or develop new programs that specifically address the local issues in a respected watershed. Traditional program delivery mechanisms have been utilized including public meetings, field demonstrations of agricultural best management practices, printed materials such as newsletters and one-on-one farm visits. Another important aspect of this project is the formation of local watershed steering committees consisting of watershed leaders who give direct stakeholder input at meetings on the direction of the project. Finally, local partnership development with other agencies and organizations with water quality interests and responsibilities is a vital function of these watershed projects.

Although all but one of these grants are watershed specific and only directly fund work in 10 counties, many of the educational products that are developed can be used statewide. Also, the 406 Regional Watershed Management grant allows us to conduct programming in other counties where water quality issues are emerging. Water quality educational efforts will become increasingly important to our clientele, especially in light of regulations such as TMDLs and AFO/CAFO strategies.

Extension Program Results and Accomplishments

Output Indicators

434	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.
401	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.
6,000	Number of clientele participating in educational events.

Outcome Indicators

62	Number of Clientele who utilize Farm*A*Syst and/or Home*A*Syst.
7,341	Number of homeowners who adopt proper lawn care practices such as soil testing, following label directions or Extension pesticide recommendations.
1	Number of participants who adopt agricultural best management practices to reduce impact on surface water quality.

Source of Funds

Smith Lever, EPA, 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).

KEY THEME: WILDLIFE MANAGEMENT

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; William Kinkaid, Environmental and Natural Resources Section, 870-543-8530, wkinkaid@uaex.edu; Kevin Jones, Family, Youth, and 4-H Section, 501-821-6884, kjones@uaex.edu

Situation

Arkansas is home to abundant wildlife that thrive in cities, suburban backyards and rural countrysides. 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.

Many Arkansans are interested in wildlife recreation and wildlife enterprises. A national survey of public interest in wildlife reported almost half (47 percent) of all Arkansans hunted, fished or watched wildlife. Wildlife enterprises contribute significantly to some local economies, particularly those in the Delta waterfowl flyways. Hunters, anglers and wildlife watchers spend an estimated $832 million annually in Arkansas.

Wildlife enterprises are sometimes overlooked as an alterative for agricultural producers. Yet when economic conditions are severe and profit margins slim, a wildlife enterprise might make the difference between a producer going under or showing a profit. Compared to intensive agriculture, wildlife habitat enhancement requires little input with potentially large gains. State and federal cost-share incentives are available for enhancing wildlife habitat in critical habitat areas with marginal agricultural production. Knowledge of these programs and information regarding eligibility and enrollment procedures are often unknown to landowners. Also, wildlife enterprises are not suitable for every landowner. Many landowners lack information for making an informed decision about whether to purse an enterprise.

A combination of abundant wildlife and public interest in wildlife has created a large demand for information about wildlife habitat enhancement, nuisance control and wildlife enterprises. 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 as well as regulatory state and federal wildlife agencies, academic faculty and

private organizations is sometimes construed as biased by private landowners.

Stakeholder Input

Stakeholders were identified through their connections to wildlife (e.g., hunters) and requests for information or assistance through Extension faculty. Stakeholders include row crop and livestock farmers, aquaculture operators, private non-farm landowners, homeowners, hunters, anglers, wildlife watchers, youth, school teachers, 4-H volunteers, Master Gardeners and natural resource professionals such as foresters, wildlife biologists, district conservationists and state and federal wildlife enforcement officers. Input from these groups was solicited during Extension programs including agriculture, forestry, wildlife, water quality, Master Gardener training, youth contests and other natural resource meetings.

Stakeholder input was collected through a statewide survey of county Extension agents and county council members collected in FY2001 that will be used to guide program direction until FY2007. Additional input was collected through focus groups comprised of Extension faculty, local producers and other Extension clientele. This stakeholder input was used to identify 11 focus programs, one of which is Diversification Through Alternative Enterprises: Wildlife.

In addition to the survey and focus groups, informal input from stakeholders was compiled, and common comments readily emerged. These groups were interested in technical information on wildlife biology and behavior, principles of wildlife management, wildlife management practices (e.g., food plots, prescribed burning, tree planting, riparian buffer development), prevention and control of wildlife damage, technical and financial assistance, designing hunting leases and how to establish a wildlife enterprise.

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, FY2003 represents the fifth 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.

A few programs were developed to inform county agents and stakeholders about emerging wildlife issues or improve access to new or different resources. An example is the development of the conservation titles in the 2002 Farm Bill that affected farmers, private landowners and wildlife enthusiasts. Extension facilitated an assembly of representatives from the farming community (e.g., Farm Bureau, rice and soybean commodity representatives), nonprofit wildlife organizations (e.g., The Nature Conservancy), and government agencies (e.g., NRCS, Arkansas Natural Heritage Commission) to develop a coalition of support. The final product, a letter outlining the specific points of agreement on each conservation title (e.g., CRP, EQIP, WHIP), was delivered to federal legislators from Arkansas as the debate over the Farm Bill occurred in Washington, D.C.

Feedback from stakeholders and county Extension agents is gathered using formal and nonformal 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" will be available FY2003 on the intranet to provide information about technical and financial support through government and nongovernment agencies, including descriptions, eligibility requirements and procedures for enrolling in conservation incentive programs.

  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 and finding ways to provide financial assistance for counties to conduct forestry and wildlife programming. In FY2002, fact sheets about black bear biology and habits, encountering black bears and encountering bats were published.

- 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. In FY2002, a new Arkansas-specific guidebook was developed which focuses on native Arkansas wildlife species and contest procedures for Arkansas Junior and Senior 4-H'ers. The 2002 4-H Forestry and Wildlife Camp for 11- to 13-year-old youth included presentations about native wildlife species. The 4-H Grasslands Evaluation Program is a comprehensive pasturelands management training tool which 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. 4-H Family Boatbuilding and Aquatic Resources project offers an exciting way to engage older (i.e., senior) youth by incorporating curricula from woodworking, fishing education, wildlife habitat, water quality, GPS, forestry and other topics into an integrated, hands-on project.

- 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.

- Lastly, 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. This is the newest area for the Wildlife Program. Currently, several proposals are in various stages of development and review. For accomplishing this program direction, we anticipate collaborating with university faculty or other agencies to conduct one or two research studies in the next few years.

Extension Program Results and Accomplishments

Output Indicators

253 Number of educational meetings, workshops, demonstrations and/or field days held to educate clientele on enhancing wildlife habitat, prevention and control of wildlife damage and wildlife enterprises.

144 Number of educational presentations through 4-H clubs and in schools to teach youth wildlife identification, management and habitat practices.

914 Number of educational materials written and/or distributed (i.e., fact sheets, news releases, conference proceedings, newsletters, handouts, etc.).

2,402 Number of clientele participating in educational meetings, workshops and seminars.

Outcome Indicators – Program Impact

2,403 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, USDA EQIP - Education

Scope of Impact

Dissemination – Information is available on the web and printed publications are available upon request. Three new publications were *Arkansas Black Bears: Biology and Habits*, *Encountering Black Bears in Arkansas*, and *Bats In and Around Your Home*.

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-four counties served through FY2002 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, 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 and Prairie. These counties have requested information about wildlife management, developed workshops or demonstrations for farmers and landowners, participated in in-service training or otherwise have performed wildlife education.

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

By any definition, Arkansas is clearly a rural state. Arkansas has 75 counties and over 430 communities. 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. Using the metropolitan/non-metropolitan designation, 50.6 percent of Arkansans live in one of the 63 non-metropolitan counties. As for the nation as a whole, only 19.7 percent of the population resides in non-metropolitan counties, according to the U.S. Census Bureau.

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 United States in earnings per wage and salary jobs. Rural areas in Arkansas continue to have lower wage rates than the urban areas of the state. Between 1996 and 2000, the average earning per job across the U.S. increased 10.9 percent compared to 7.5 percent in Arkansas, a 31 percent difference. In 1999, Arkansas ranked 48th in the United States for median household income. Median household income continues to be much lower in the rural areas of Arkansas compared to urban areas. The Delta continues to have the lowest median household income among 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 19.5 percent.

Poverty in Arkansas contributes to a multitude of food security, youth development and community development challenges. 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.

Total FTEs

Total Budgetary Amount

KEY THEME: CHARACTER/ ETHICS EDUCATION

Program Response: Raising Arkansas Youth (RAY)

Contact: Elizabeth Jones, State Asset Building Program Coordinator, 2301 S. University Avenue, P.O. Box 391, Little Rock, Arkansas 72203; 501-671-2027; 501-671-2294 (fax) ejones@uaex.edu

Situation

Why do some kids grow up with ease while others struggle? Why do some kids get involved in dangerous activities while others spend their time contributing to society? Why do some youth "beat the odds" in difficult situations while others get trapped? In recent years many of our prevention programs have focused on single issues such as substance abuse, violence or teen pregnancy. Reality and research suggests social problems rarely have a single cause or solution. Many factors influence the successful development of young people. Research has shown that 40 developmental assets can help young people make wise decisions, choose positive paths and grow in competent, caring and responsible ways.

Stakeholder Input

The framework of 40 development assets was developed by the Search Institute in consultation with youth development experts during the early 90s. Since that time the asset-approach has been adopted by many national, state and community organizations. Support from the Donald W. Reynolds Foundation created an opportunity for the formation of Arkansas' statewide asset-building initiative known as "Raising Arkansas Youth" (RAY). RAY is a non-profit organization coordinated by the Cooperative Extension Service and under the leadership of a diverse board of directors. To assure adequate stakeholder input, the RAY board represents geographic regions and organization sectors throughout the state. RAY receives input and provides training to educational, governmental, congregational and other youth and family serving organizations. Most importantly, RAY actively strives to give youth a participating voice. Youth have been an instrumental part of training and conference activities and have been recruited for board and leadership positions.

Overview

While the assets are powerful shapers of young people's lives and choices, too few young people experience many of these assets. Twenty-five of the 40 assets are experienced by less than half of the young people surveyed. Youth with the most assets are least likely to engage in high-risk behavior such as problem alcohol use, illicit drug use, sexual activity and violence. In addition to protecting youth from negative behaviors, having more assets increases the chances that young people will have positive attitudes and behaviors. Some of these are the facts that they succeed in school, value diversity, maintain good health and they are willing to delay gratifications. The purpose of RAY is to encourage and applaud activities and interactions that promote the development of assets in children and youth.

As a statewide initiative, RAY is promoting positive youth development through the media, training and collaborative program. A key goal is to infuse an asset philosophy in other programs. A variety of community and state partners are finding ways to incorporate the asset-building philosophy into their policies and program. A few include the University of Arkansas Cooperative Extension Service, Little Rock Schools, 4-H, Big Brothers/Big Sisters, YWCA, Arkansas Promise, Division of Volunteerism, Little Rock Air Force Base, Sheriff's Boys and Girls Ranch and a number of congregations and civic organizations. Each of these organizations is involved in teaching the asset building principles and incorporating the philosophies into their respective programs.

Extension Program Results and Accomplishments

18 University of Arkansas Cooperative Extension Service counties are directly involved in promoting and delivering asset programs. All other counties are indirectly involved via incorporation of the asset-message into the Best Care and Family and Community Connections programs.

120 The number of asset-building programs/trainings and workshops the RAY coalition of asset builders has delivered to over 10,000 people during the past year.

62 The number of people from Arkansas who attended the 2002 National Healthy Communities/Healthy Youth National Convention. More than half of the Arkansas delegation was youth.

– KARK-TV Channel 4 did a two-day special feature segment for the evening news and provided publicity for those attending the HC/HY Conference.

– Kids Count Data Book 2002 – Exploring Opportunities for Children in Uncertain Times has included the Search Institute Developmental Assets in their latest publication. The information and asset language presented in this data book shows various internal and external assets available to children in Arkansas.

Arkansas organizations that have reported incorporating the developmental assets into their programs include:

– North Little Rock Boys and Girls Club
– University of Arkansas Cooperative Extension Service
– The Arkansas Sheriff's Ranch

- The Hot Springs YMCA
- Centers for Youth and Families
- P.A.R.K.
- Little Rock Schools

Source of Funds

Donald W. Reynolds Foundation

Scope of Impact

Dissemination – The program has received many free education materials from Healthy Communities, Healthy Youth and Search Institute. These materials have been distributed to people that attended training sessions and educational programs. RAY also has informational brochures and displays that are available for marketing the developmental assets. Materials are available by contacting Elizabeth Jones at 671-2027

Scope of Program – Arkansas

KEY THEME: CHILD CARE/ DEPENDENT CARE

Program Response: The Best Care: Best Care Connected; Best Care Myths and Magic

Contact: Traci A. Johnston, Child Care Assistant, 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 percent) 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 percent) Arkansas mothers with children under the age of five are in the workforce. Almost 3 in 4 children (72 percent) under the age of 6 live in families with both parents working.

Currently 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 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 three 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 2002, child care providers attended classes on bringing out the best in your child care team, cleanliness and disease control, handwashing, asthma, creating teachable moments in everyday settings, self-regulation and the emotional development of children, food, fun and reading, learning through play and learning through toys. 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. The web-based program targets child care directors and family child care home providers with business applications. 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.

Best Care Myths and Magic – Best Care Myths and Magic is a five-hour workshop that takes quality training by recognized experts to rural communities via compressed interactive video technology (CIV). CIV allows two-way communication with multiple rural sites throughout the state. The Best Care Myths and Magic program is designed to debunk popular myths surrounding the development of children and to explore the awesome magic of child growth and development. The training is conducted on one Saturday and then repeated on two Monday evening sessions.

Extension Program Results and Accomplishments

Output Indicators

2003 Program	Providers Reached	Hours of Training	Classes
The Best Care	1,970	279	87
Best Care Connected	196	5 - Spring 5 - Fall	2
Best Care Myths & Magic	2,213	5 - Spring 5 - Fall	3

Outcome Indicators

The Best Care

100% of post evaluation participants indicated significant pre/post knowledge gains.

32% of post evaluation participants indicated pre/post knowledge gains in the area of resource management.

29% of post evaluation participants indicated pre/post knowledge gains in the area of nutrition.

25% of post evaluation participants indicated pre/post knowledge gains in the area of health and safety.

27% of post evaluation participants indicated pre/post knowledge gains in the area of child development.

Best Care Connected

43% of participants Strongly Agreed that the course content was useful.

43% of participants Strongly Agreed that the course content was challenging.

Best Care Myths and Magic

43% of participants Strongly Agreed that the purpose of the unit was clear/interesting.

41% of participants said the overall training did meet their needs (rated Excellent).

47% of participants rated the overall training to be Excellent.

Source of Funds

All three Best Care 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 Myths and Magic has been conducted in eight different counties, with participants from these eight counties and surrounding counties. Best Care Connected is conducted through the Internet.

KEY THEME: CHILDREN, YOUTH AND FAMILIES AT RISK

Program Response: The Adolescent Sexuality, Pregnancy and Parenting Program

Contact: Sarah L. Anderson, Ed.D., CFCS, Professor and Extension Family Life Specialist, School of Human Environmental Sciences, HOEC 225A, University of Arkansas, Fayetteville, AR 72701, 479-575-7113, slanders@uark.edu

Situation

The outcomes of adolescent sexuality, pregnancy and parenting affect all of us. The poor outcomes for teen parents and their children increase our taxes, decrease our skilled labor pool and lower the education level of our population. Consider the following:

- More than half (56%) of Arkansas high school students report having had sexual intercourse with almost a quarter (22%) having had at least four partners.
- 4 in 10 teenage girls get pregnant at least once before they reach age 20.
- Arkansas ranks eighth in teen pregnancy rate and second in teen birth rate.
- Over 10,000 Arkansas teens 15 to 19 get pregnant each year.
- Although the teen birth rate has declined slowly but steadily in recent years, the rate of black and Hispanic teen birth rates remains higher than for other groups.
- Before 1980, most teens giving birth were married, whereas most teens giving birth today are unmarried.

- The younger an adolescent girl is when she has sex for the first time, the more likely she is to have had unwanted or non-voluntary sex.
- Adolescent mothers are less likely to complete high school and more likely to live in poverty, be dependent on welfare, be single parents and have more children.
- Children of teen mothers are at greater risk of abuse and neglect, experiencing health problems and doing poorly in school. Sons of teen mothers are more likely to end up in prison while daughters are more likely to become teen mothers themselves.
- Adolescent fathers are more likely to complete fewer years of education and to hold blue-collar or low-prestige jobs.
- A majority of both boys and girls who are sexually active wish they had waited to have sex.

Teen pregnancy is not new, nor is it likely to be totally eliminated. However, we can help to prevent teen pregnancy and its adverse outcomes. What helps prevent teen pregnancy?

- The primary reason teen girls give for abstaining from sex is that it is against their religious or moral values.
- Teens who have strong emotional attachments to their parents are much less likely to become sexually active at an early age.
- Most people say that teens should remain abstinent, but should have access to contraception. Contraceptive use among sexually active teens has increased, but remains inconsistent.
- Teens rate their parents high as trustworthy and preferred sources of information on birth control.
- Teens who have been raised by both parents (biological or adoptive) from birth have lower probabilities of having sex.
- Teens want their parents to talk to them about sex and sexuality.

The high rates of teen birth and the adverse outcomes noted in Arkansas provide strong justification for the need for research-based educational programs for parents of teens and pre-teens in the area of sexual health. Educators, health care and social services providers express a desire for more knowledge and skill in working with teen parents and their families. Professionals working in the state expressed a strong desire to have better information about effective programs and what was happening in this area across the state.

Stakeholder Input

Actions Taken to Seek Stakeholder Input – Several groups were invited to participate in an educational session related to violence and maltreatment among adolescent parents and their children. These groups included teen parent educators, Family and Consumer Sciences educators, Extension faculty, adolescent health care providers and social services providers in programs targeting adolescent parents and their families, Extension Homemakers and 4-H Volunteer leaders, other volunteers and parents of adolescents. Participants were surveyed regarding the work they do with teen parents and their families, the needs they saw as they worked with teen parents and their families, and suggestions for programmatic response.

The Extension specialist maintains a database of stakeholders and continually sends information related to adolescent sexuality, pregnancy and parenting to them. Input from stakeholders is sought on an ongoing basis through personal contacts, electronic mail, etc.

Statement of the Process Used to Identify Stakeholders and Collect Information – The Extension specialist identified potential stakeholders in state departments/agencies of health, human services, and education, the university and children's hospital, Extension Homemaker and 4-H leaders, teen parent educators, Family and Consumer Sciences educators, Extension faculty, relevant professional groups and public meetings. Electronic list serves and e-mail were used widely to invite participation of potential stakeholders, who were also asked to forward information to colleagues and others. Stakeholders were surveyed regarding the work they do with the audience, what

their needs are for education, and what is needed to address the current situation in Arkansas. Those unable to attend the session were provided surveys by electronic mail, surveyed over the phone or in person by the Extension specialist.

Statement of How Collected Input Was Considered – A primary need was for a statewide network that would share information, research, successful programs, etc., with those working with teen parents and their families. In addition, educational training for providers and parents of teens, research-based curricula, funding sources and evaluation were also noted as needs.

Overview

Program was initiated in FY2002. Overview follows:

ArBAPPS – Arkansas Bridge to Adolescent Pregnancy, Parenting and Sexuality

The Arkansas Bridge to Adolescent Pregnancy, Parenting and Sexuality (ArBAPPS) is a network of professionals, educators, volunteers, parents and others who are interested in working in the area of adolescent sexual health. It is open to anyone interested in a research-based response to adolescent pregnancy, parenting and sexuality concerns. Through a list serve, ArBAPPS disseminates research, resources, curriculum development and evaluation tools in order to assist individual, community and state leaders in the areas of adolescent pregnancy, parenting and sexuality (APPS). In addition, through collaboration with key state and community stakeholders, cross-county partnerships can be formed to develop innovative educational and research projects on current APPS issues.

ArBAPPS is associated with the National Extension workgroup BAPPS, Bridge to Adolescent Pregnancy, Parenting and Sexuality. BAPPS is a workgroup of the Children Youth and Families Education and Research Network (CYFERNet). CYFERNet is a national network of Land Grant University faculty and county Extension educators working to support programs for children, youth and families funded by the Cooperative State Research, Education and Extension Service, U.S. Department of Agriculture.

The ArBAPPS position papers as well as the discussion of Extension's response, resources, program goals and plans of action are taken from the BAPPS website. Neither the CSSREES, the University of Arkansas, the University of Arkansas Cooperative Extension Service, nor the Family and Consumer Sciences Program endorses the organizations represented. It is the responsibility of the user to evaluate this information based on individual needs and community standards prior to use.

Adolescent Sexuality Component

The adolescent sexuality development includes physical, intellectual, social and emotional change. This development occurs in the context of the family, peer group and community. The family and peer group are particularly important influences in the lives of teenagers. While adolescent development is characterized by the growing importance of the peer group to individual adolescents, the family remains the primary influence in an adolescent's life (Elder, 1992). Research shows that we place a great burden on our sexuality education programs and educators if we expect them to change behavior. Therefore, this program will focus on increasing knowledge about sexuality, changing attitudes about sexuality and sexual behavior and/or promoting responsible adolescent sexual behavior.

Adolescent Pregnancy and Parenting Component

Prevention of adolescent pregnancy is the ideal goal. Significant morbidity to young mothers and fathers, their children and society is associated with adolescent pregnancy. Cooperative Extension has identified a need for educational programs that address issues associated with adolescent pregnancy. Educational efforts will be directed to both male and female teens, the parents of pregnant adolescents, educators, community members, decision-makers and stakeholders.

Adolescent parenting creates special challenges as teens attempt to address their own needs while simultaneously meeting the needs of their young child(ren). The impact of the success or failure in meeting that challenge has implications for the teens, their children, their families, the community and the nation. Obtaining reliable knowledge and skills for parenting and addressing personal needs are essential for the positive development of adolescent parents and their children.

Extension Program Results and Accomplishments

Output Indicators

1 4-hour educational session conducted, Maltreatment of Adolescent Parents, 15 participants; multi-state satellite event; follow-up evaluation results not yet finalized.

5 Electronic mailings with program information to 200+ individuals reached directly (total 1000+ contacts).

200 ArBAPPS established network of professionals, volunteers, etc.

185 Youth participants completing Howard County Baby Think It Over program.

395 Youth articipants completing Lafayette County Baby Think It Over program.

Outcome Indicators

– Communication and collaboration between individuals, programs and agencies working in the area of adolescent sexuality, pregnancy and parenting is enhanced.

580 Youth in four school districts in Howard and Lafayette counties reporting increased knowledge of parenting responsibilities through the *Baby Think It Over* program.

– Lafayette County experienced a reduction in teen pregnancy rate from 10 percent to 2.2 percent over the four year period the of the *Oh Baby, Baby* program.

Sources of Funds

Smith Lever

Scope of Impact

Dissemination – Program is available in all counties as well as to all state and county agencies/organizations working in area of adolescent sexuality, pregnancy and parenting. Materials are available to county field staff via the Extension intranet (private web site).

Scope of Program – Statewide, but current involvement in ArBAPPS is primarily in Pulaski and other central Arkansas counties through state agencies/organizations.

Programs of Excellence

Oh, Baby, Baby

In the fourth year of operation, the Baby Think It Over project continued to make an impact on teens in Lafayette County. Three hundred ninety-five students have participated so far in the Baby Think It Over project. Of youth completing the program only 9 pregnancies (2.2 percent) have resulted. This compares to the overall teen pregnancy rate of 10 percent in Lafayette County.

General Program Information – Purchased from a grant for the Lafayette TEA (TANF) Coalition, infant simulators, equipment for simulator project, educational videos, leader guides and curricula have been used to promote abstinence and delay of sexual behavior, awareness of the consequences of teen pregnancy and parenthood and the responsibilities involved in parenthood. Although the TEA (TANF) Coalition has ended its program, all three school districts in the county have continued the program under the supervision of the Family and Consumer Sciences teachers. Participating agencies include Department of Human Services, Child Services and Foster Parents; Lafayette County Health Department; and the Lafayette County Extension Office.

Location – Lafayette County; 3 school districts; 395 youth

Contact: Terri Treadway, County Extension Agent – Family and Consumer Sciences, Lafayette County, Arkansas, ttreadway@uaex.edu.

KEY THEME: COMMUNITY DEVELOPMENT

Program Response: The Cooperative Extension Service Home-Based Business Program

Contact: Kim Magee, Instructor, 501-671-2081, kmagee@uaex.edu, Agricultural Economics and Community Development

Situation

Home-based business education and assistance is a needed resource for rural economic development.

Stakeholder Input

Clients are identified when they call the Cooperative Extension Service for assistance with a home-based business. Input is collected from clients as a standard procedure.

Overview

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.

Extension Program Results and Accomplishments

Output Indicators

8 Distributed Home-Based Business Workbooks published by Cooperative Extension Service

27 One-on-one consultations (in-office or telephone) conducted.

1 Assisted in the program implementation of a home-based business seminar sponsored by the University of Arkansas at Little Rock's Small Business Development Center.

Outcome Indicators

1 Home-Based business client successfully started a business in their home.

Source of Funds

Fund 13301; ORG 7500

Scope of Impact:

Dissemination – 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.

Scope of Program – Pulaski and Washington counties

Program Response: Citizen Action Produces Strength

Contact: Kim Magee, Instructor, 501-671-2081, kmagee@uaex.edu, Agricultural Economics and Community Development

Situation

Youth in Arkansas have a need for leadership/ government/citizenship skills they can use for a lifetime.

Stakeholder Input

Evaluations are collected annually from all delegates, junior counselors, adult leaders and

county agents. Suggestions are then incorporated into the following year's program.

Overview

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 of 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.

Extension Program Results and Accomplishments

Output Indicators

56 Delegates attended the CAPS workshop.

3 Adult leaders attended the CAPS workshop.

8 Junior counselors attended the CAPS workshop.

Outcome Indicators

28 County Action Plans were developed for Arkansas.

5 County Action Plans were followed through on and are still in place.

Source of Funds

The workshop is funded by fees of $85 per delegate. Counselors and leaders pay a fee of $42.50.

Scope of Impact

Dissemination – 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.

Scope of Program – Pulaski and Perry counties.

Program Response: Local Government and Public Issue Education Program

Contact: Wayne Miller, Agricultural Economics and Community Development, (501) 671-2085, wmiller@uaex.edu

Situation

Arkansas is one of 39 states that permit citizens to initiate constitutional amendments and acts that appear on the General Election ballot for voters to accept or reject. Unlike in some states, the state of Arkansas does not provide voter guides explaining the proposed constitutional amendments and acts to the voters. Many people and organizations rely on the Cooperative Extension Service to produce educational material explaining the initiated acts and amendments.

In Arkansas there is little information provided about state and local public issues that is unbiased and that presents the issues in easy to understand language. The proponents and opponents of proposed legislation often exaggerate the implications and sometimes provide misleading information.

State and local government revenues have not been growing enough to keep up with increased demands. While state and local leaders must make decisions on how to generate and allocate funds, there is little information available on options and implications available to leaders on which to base decisions.

- Voters in Arkansas were given the opportunity to vote on three proposed constitutional amendments and one initiated act at the November 2002 General Election.

- The Arkansas Supreme Court ruled that Arkansas' current public education system is inadequately and inequitably funded.

- During the current 2003 legislative session the Arkansas legislature must find additional revenue for primary and secondary schools, health and human services and the criminal justice system.

The citizens of Arkansas need a reliable source of unbiased information on state and local public issues to be able to make intelligent choices regarding the use and misuse of public resources.

Stakeholder Input

- A collection of approximately 12 statewide organizations called "APPLES" requested Cooperative Extension Service (CES) assistance in providing information on the proposed constitutional amendments and initiated act.

- Union County officials requested CES assistance in developing an educational program on a proposed 1 percent sales tax for a water pipeline.

- The City of Maumelle requested CES to help evaluate the feasibility of annexing a portion of the Morgan area and to conduct a study of the potential revenue from a 1 percent city sales tax.

Overview

Arkansas is at a crossroads and must determine whether it has the political will to invest in its people and telecommunications infrastructure to compete in today's global economy. Much legislation on state and local issues has been proposed in recent years, which could significantly affect Arkansas' ability to provide its people with the resources and skills needed to maintain or enhance their quality of life. The general public is often asked to vote on the proposed legislation without information as to the implications and impact of the legislation on the state and local communities. Therefore, the local government/public policy education program was developed to:

- Provide information and analysis of legislative and citizen initiatives that require citizens' approval at a general or special election.

- Provide local and state leaders and citizens with an understanding of the relationship between sources of revenue and services provided.

- Provide local and state leaders and citizens with knowledge of existing and alternative revenue sources and their impacts on different socio-economic groups.

- Provide a comparison of expenditures for services provided among state and local governments to identify potential for improving services.

Extension Program Results and Accomplishments

Output Indicators

– Prepared, printed and distributed 205,000 copies of four fact sheets on the three proposed constitutional amendments and one initiated act that appeared on the November 2002 general election ballot.

– Provided training on the four ballot issues to 75 county staff chairs.

– Prepared a PowerPoint presentation with notes on the three constitutional amendments and one initiated act that was used by county Extension agents and state organizations to provide information to their constituencies.

– Presented information on the three proposed constitutional amendments and one initiated act that aired on the Arkansas Educational Television Network (AETN).

– Made 80 presentations on the three constitutional amendments and one initiated act to community civic organizations and professional associations.

– Other organizations made approximately 40 presentations using resource materials provided by CES.

– Estimated the sales tax revenue from grocery sales generated by county governments.

- Prepared a fact sheet and developed an educational program on a proposed sales tax increase for Union County.

- Conducted a study of the potential revenue from a 1 percent Maumelle City sales tax and assisted with a study to determine the feasibility of the City of Maumelle annexing a portion of the Morgan area.

Outcome Indicators

- Community and state leaders stated that the fact sheets made the issues understandable and that the fact sheets were widely distributed and read.

- People requested over 200,000 copies of the fact sheets on the ballot issues.

- Union County officials were pleased with the CES educational program and the support received for the water project.

- The City of Maumelle officials are incorporating our findings into their recommendations for the city.

Source of Funds

The Maumelle project was funded by the City of Maumelle. Other programs were funded by CES. 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 inform their constituencies. Resource materials are available in printed copy, on the CES web site and on CD.

Scope of Program – Many organizations used our materials in conducting workshops on the 2002 ballot issues. City of Maumelle officials adopted our recommendations in their 2003 presentation to the City Council.

Program Response: National Institute on Cooperative Education (N.I.C.E)

Contact: Kim Magee, Instructor, 501-671-2081, kmagee@uaex.edu, Agricultural Economics and Community Development

Situation

Educating our youth on the topic of agricultural cooperatives is a goal of the National Institute on Cooperative Education (N.I.C.E)

Stakeholder Input

The Cooperative Extension Service program coordinator serves on the conference planning committee. The Arkansas Cooperative Extension NICE coordinator also serves as a youth ambassador judge and has major input in the selection of two of the youth delegates (out of 600) who will represent the National Council of Farmer Cooperatives for a period of one year.

Overview

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.

Extension Program Results and Accomplishments

Output Indicators

6 Arkansas youth attended the conference.

2 Arkansas adult leaders attended the conference.

Outcome Indicators

1 Arkansas youth delegate was chosen as a finalist for a youth ambassador slot.

Source of Funds

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.

Scope of Impact

Dissemination – The N.I.C.E program is available to 15- to 21-year-olds involved in one of the following organizations: 4-H, FFA, FHA. We approach three organizations with informative brochures provided by NCFC, and the selection process is determined by the individual organizations

Scope of Program – The program is available on a statewide basis, rather than on a specific county level

Program Response: University of Arkansas Farm Income Tax School

Contact: Kim Magee, Instructor, 501-671-2081, kmagee@uaex.edu, Agricultural Economics and Community Development

Situation

Continuing Professional Education Units are required annually for professionals credentialed by the Public Board of Accountancy.

Stakeholder Input

Evaluations are collected at the conclusion of each of the schools. Participants are given a small reward for completing and turning in evaluations. Frequent reminders are given throughout the two-day school. Evaluation data is entered into a computer and results are sent to the University of Illinois as well as CES administrators.

Overview

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.

Extension Program Results and Accomplishments

Output Indicators

10 Two-day schools are conducted at the following locations around Arkansas: Harrison, Springdale, Fort Smith, Texarkana, Jonesboro, West Memphis, Monticello, Batesville, Little Rock and Hot Springs

Outcome Indicators

516 Participants received 16 hours of Continuing Professional Education credits

Source of Funds

The schools are solely funded by the registration fees received from the participants.

Scope of Impact

Dissemination – 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.

Scope of Program – Tax School is delivered in Pulaski, Garland, Craighead, Washington, Boone, Sebastian, Miller, Crittenden, Drew and Independence counties.

Program Response: VISION 2010 Program – Building Healthy, Sustainable Communities for the 21st Century

Contact: Mark Peterson, Agricultural Economics and Community Development Section, (501) 671-2253, mpeterson@uaex.edu

Situation

At the beginning of the 21st century, Arkansas communities are confronted with great challenges and new opportunities. Community leaders are confronted with the impacts of major changes in our society: globalization, information technologies, demographic changes, the changing nature of work, increasing concern for the natural environment, threats of terrorism, social ills and regional economies. Although we are in the early stages of the knowledge-based economy, new technologies have already impacted how we do things, as well as what we do. In this new era, the early stage of a knowledge-based economy, the rules for success have changed, and the need for community leaders to learn how to think, plan and act strategically has never been greater.

Stakeholder Input

The initial design of the VISION 2010 Partnership Program was based on extensive, statewide process of citizen involvement and discussion which included six focus groups of local leaders (one of which was of youth), and a detailed survey of LeadAR alumni and Chamber of Commerce directors. (The LeadAR Program is an intensive leadership development program initially funded by the Kellogg Foundation.) Substantive discussions of the Information Age and the challenges and opportunities facing community leaders in this new era were also held with five other significant groups, for a total of 300 individuals. Furthermore the VISION 2010 Partners, representing hundreds of years of professional experience in community, leadership and economic development, have engaged in extensive discussions leading to the design of the VISION 2010 Program.

The implementation of the VISION 2010 program has effective mechanisms to insure that it discovers and responds to the real issues and concerns of local citizens:

- Before each round of communities, a focus group session is held with the community leaders in each community to surface the most important challenges and opportunities.

- The strategic visioning process that is taught in VISION 2010 and utilized by the participating communities engages the citizens of the community in describing and realizing their desired futures. This input is then used to develop and implement a strategic plan for the future of the community.

- The process taught to the community leaders is wholistic, and engages all sectors of the community, including low income and under-represented groups. For example, the Siloam Springs VISION 2010 group held meetings with its Hispanic residents *in Spanish*, to discover what they wanted the community to become.

- In addition, an evaluation was conducted of the VISION 2010 Program by an independent evaluation firm, with these elements: a focus group with each of the seven Round II communities, and interviews with four key leaders in these communities who were not directly involved in the planning process. The evaluation provided valuable feedback on the viability of the program and its responsiveness to the issues facing these communities.

Overview

With a goal of building healthy, sustainable communities for the 21st century, the VISION 2010 program engages 29 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. Seminars teach leadership and facilitation skills, provide experiential learning about education and workforce preparation, economic and community development, the power of information technology, a ten step development process for communities and ten principles for strategic leaders. 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.

Extension Program Results and Accomplishments

Output Indicators

9 Strategic Visioning Sessions/270 participants. Town meetings or training sessions that involve community leaders in describing their desired futures and how to realize those futures.

4 Presentations on Dealing with Change to conferences or leadership classes with 185 participants.

6 Feature articles, 32 newsletter articles, electronic and hard copy newsletters for community features were disseminated to 1,394 individuals. 613 individuals from VISION 2010 communities received information on new resources available, and an educational series on strategic leadership and innovation.

Outcome Indicators

Through VISION 2010, community leaders learn to engage a broad base of the community in developing their visions for the future. Strategic assets are identified and incorporated into Action plans that help the communities realize their desired future. In the last six years, VISION 2010 engaged 21 communities with a combined population of over 320,000 people in the process of developing strategic visions and action plans. Community populations ranged from 503 to 80,000 people. The largest, Garland County, hired a facilitator to implement the VISION 2010 strategic visioning process across the entire county.

Through these efforts, VISION 2010 communities have involved over 7,000 citizens in strategic visioning processes, invested over $1.5 million in their own communities, attracted over $4.5 million in grants and appropriations, and channeled an additional $9 million of tax revenues into local projects. Furthermore, the VISION 2010 Partners donated over $500,000 of in-kind resources to VISION 2010 over a 2-year period.

An evaluation of VISION 2010 Round II, just completed by an independent consultant, revealed that as a result of VISION 2010:

97.5% of the VISION 2010 participants have a shared vision for the future of their community.

62.5% have an understanding of the knowledge-based economy.

70% have a lot of exciting projects going on.

77.5% percent have developed a strategic plan.

75% percent are implementing their plans.

For example, the Delta community of Marion surveyed residents at their Spanish festival, leading to $25,000 invested in playground equipment, renovation of their library, holding a Marion Day on the Square, renovated historic markers, and a retail development initiative.

Source of Funds

Smith-Lever 3b and 3c.

Scope of Impact

Dissemination – The VISION 2010 Program is available to all interested communities in Arkansas, with the first point of contact usually being the local county Extension agent. Information is also available on the VISION 2010 web page (v2010.org). Our electronic (and hard copy) newsletter e-VISION is a primary means of dissemination, and sends valuable information to community leaders throughout Arkansas as well as some in other states and countries.

Scope of Program – VISION 2010 is a program in Arkansas that has involved communities in these counties: Conway, Jefferson, Randolph, Pike, Independence, Monroe, Crawford, Crittenden, Carroll, Benton, Scott, Sebastian, Polk, Clark, Calhoun, Hempstead, Garland, Hot Spring, Logan, and Ouachita.

KEY THEME: FAMILY RESOURCE MANAGEMENT

Program Response: Money 2000

Contact: Judith R. Urich, Family Resource Management Specialist, 501-671-2066, Family and Consumer Sciences, jurich@uaex.edu

Situation

The most significant economic issues Arkansas families face 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 an employment search.
- Low median annual incomes to purchase needs and wants.
- The combination of a low national savings rate and high debt levels presents serious economic problems for many families. Bankruptcy filings in Arkansas rose 28 percent between 2000 and 2001, the last reporting year.

Stakeholder Input

Using a discussion and priority setting process, the County Extension Councils in 69 Arkansas counties identified this issue as a major emphasis for their long-range education program.

Overview

The Money 2000 Program originates in the county. Participants agree to participate by writing financial debt reduction and savings goals for the year, furnishing physical and e-mail addresses to receive newsletters, requesting information from the Extension web site or county Extension office. Financial management educational programs may or may not be offered, but if so, they are marketed to Money 2000 clientele as well as others.

Extension Program Results and Accomplishments

Output Indicators

955	Adults enrolled in Money 2000.
127	Youth enrolled in Money 2000.
467	Number of educational meetings related to teaching resource management skills.
7,819	Number of participants attending educational meetings related to resource management skills.
578	Number of educational publications and other materials developed to educate people about resource management.
4,812	Number of hours spent planning, conducting, marketing and evaluating educational programs related to resource management.

Outcome Indicators

867	Number of adults who developed a written spending plan.
1,012	Number of adults who have established a financial goal.
664	Number of adults who reported an increase in savings.
2,079	Number of youth who reported an increase in savings.
$254,077	Dollar amount of increased savings reported by adults.
619	Number who reported a decrease in debt.
$477,238	Dollar amount of decreased debt reported.
971	Number of participants who developed a plan to meet future financial needs.
823	Number of participants who reported having a system to maintain financial records.

631	Number of participants who reported increased satisfaction with their quality of life.
1,285	Number of participants who feel more confident about managing available resources.
426	Number of participants who reported an increased ability to pay expenses from month to month.
847	Number of participants reporting increased satisfaction with their financial well-being.
597	Number of adults who reached a financial goal.

Program Impact Between January, 1999 and December, 2002

$582,121	Dollar amount of increased savings reported by participants
$1,114,907	Dollar amount of decreased debt reported by participants.

Source of Funds

Smith-Lever

Scope of Impact

Dissemination – Money 2000 program information is mailed to all 75 counties, information is available on the Extension web site (www.uaex.edu) and printed newsletters are mailed quarterly. A monthly-hint listserv is offered. Individual counties offered financial education programs to Money 2000 participants and others.

Scope of Program – 66 of 75 counties (88 percent) of counties participated by attending educational programs, receiving a quarterly printed newsletter, subscribing to a monthly e-mail list of money management hints and reporting progress toward financial debt reduction and savings goals.

Participating Counties:

Ozark District: Baxter, Benton, Boone, Carroll, Cleburne, Conway, Crawford, Faulkner, Franklin, Independence, Izard, Johnson, Logan, Madison, Marion, Pope, Searcy, Sebastian, Sharp, Stone, Van Buren, Washington, Yell.

Delta District: Arkansas, Ashley, Clay, Craighead, Crittenden, Cross, Drew, Greene, Jackson, Jefferson, Lawrence, Lee, Lonoke, Mississippi, Monroe, Phillips, Poinsett, Randolph, St. Francis, White, Woodruff.

Ouachita District: Calhoun, Clark, Columbia, Garland, Grant, Hempstead, Howard, Lafayette, Little River, Miller, Montgomery, Nevada, Ouachita, Perry, Pike, Polk, Pulaski, Saline, Scott, Sevier, Union.

Program Response: Money & You

Contact: Judith R. Urich, Family and Consumer Sciences, 501/671-2066, jurich@uaex.edu

Situation

The percentage of Arkansans living below the poverty level was 17.1 percent in 2001. Poverty rates are higher in the rural areas, 22.5 percent. Nearly one in two (45 percent) of the children in Arkansas were living at or below 185 percent of the federal poverty level.

Families with limited resources are especially vulnerable. Employed parents must solve transportation and childcare problems in order to accept or stay in employment.

The majority of poor households (55 percent) compared to non-poor households (13 percent), live with at least one of the following deprivations in any one year: eviction, utility disconnects, housing with upkeep problems, not enough food in the past four months, crowded housing, no refrigerator, stove or telephone.

The most significant economic issues Arkansas families face 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 an employment search.
- Low median annual incomes to purchase needs and wants.

Stakeholder Input

Using a discussion and priority setting process, the County Extension Councils in 11 Arkansas counties identified teaching financial management to limited resource families as a major emphasis for their long-range education program.

Overview

The Money & You curriculum is a multi-state curriculum (Arkansas, Louisiana, Mississippi) accessible electronically to trained agents in the three states. The curriculum teaches basic money management to limited-resource audiences. Although some of the participant resources are available on web sites, the curriculum is accessed through the county agent who may choose to provide direct teaching to clients or train program assistants and volunteers to use the curriculum. The program is delivered primarily with clients of preformed groups such as Head Start, HIPPY (Home Instruction Preschool Programs for Youth), HUD housing residents, TEA (Temporary Employment Assistance) clientele, teen mothers, substance abuse rehabilitation clients, pregnancy prevention programs and workforce preparation program participants.

Extension Program Results and Accomplishments

Output Indicators

1,094 Number of educational sessions conducted.

7,693 Number of limited resource parents reached.

7,068 Number of educational publications and other materials developed to educate limited resource audiences about resource management.

6,919 Number of hours spent planning, conducting, marketing and evaluating educational programs related to resource management in limited resource families.

5,823 Number of contact hours spent reaching limited resource clientele.

Outcome Indicators

1,013 Number who reported an increase in savings.

$21,012 Dollar amount of increased savings reported by participants.

125 Number of participants who reported a decrease in debt.

$24,951 Dollar amount of decreased debt reported by participants.

331 Number of participants who reported increased satisfaction with their quality of life.

338 Number who feel more confident about managing available resources.

263 Number of participants who reported increased ability to pay expenses from month to month.

239 Number of participants reporting increased satisfaction with their financial well-being.

238 Number of participant households, which reached a financial goal.

Source of Funds

Smith Lever

Scope of Impact

Dissemination – The Money & You curriculum is a multi-state curriculum (Arkansas, Louisiana, Mississippi) accessible electronically to trained agents in the three states. The curriculum teaches basic money management to limited resource audiences. All of the participant resources are

available to county agents on a password protected web site. The curriculum is accessed through the county agent. The agent may choose to deliver the program directly to clientele or train program assistants and volunteers to use the curriculum.

Scope of Program – The following Arkansas counties used the curriculum.

Ozark District: Stone
Ouachita District: Cleveland, Columbia, Dallas, Hot Spring, Howard, Lafayette, Pulaski, Saline, Union
Multi-state Extension: Arkansas, Louisiana, Mississippi

Program Response: Youth Financial Management

Contact: Judith R. Urich, 501-671-2066, Family and Consumer Sciences, jurich@uaex.edu

Situation

In 2001, teens spent $172 billion, up from $155 billion in 2000. That translates to an average of $104 per week. However, in a nationwide survey on financial knowledge administered to high school seniors in the same year, the students answered only 50 percent of questions correctly. In another survey, conducted in 2001, only 7 percent of 1,000 parents responding said their children (aged 6-17) understand financial matters very well.

Stakeholder Input

Using a discussion and priority setting process, County Extension Councils identified this issue as a major emphasis for their long-range education program. Extension networked with the AR Jump$tart Coalition and local Arkansas High Schools to offer the High School Financial Education Program (HSFFP).

Overview

Due to the limited financial knowledge of American teens, the National Endowment for Financial Planning, in partnership with the Arkansas Cooperative Extension Service and the Arkansas Credit Union League, sponsors the HSFFP. It includes a series of seven lessons on basic financial literacy, teaches goal setting, credit management, risk management, saving for the future and other topics. A variety of other youth money management activities and curriculum are used to teach wise money management. These programs include Kids and Cash, Consumer Judging Activities, The Cash Kids and Money $ense for Kids where the emphasis is placed on how to develop spending plans, set goals, save money and use credit wisely.

Extension Program Results and Accomplishments

Output Indicators

93	Number of schools and other educational facilities in Arkansas teaching the HSFPP.
5,935	Number of students enrolled in the HSFPP.

Outcome Indicators

417	Number of youth who developed a written spending plan.
564	Number of youth who established a financial goal.
195	Number of youth who reported an increase in saving.
$25,128	Dollar amount of increased saving reported by youth.
112	Number of youth who reached a financial goal.
1,864	Number of youth who increased knowledge of basic money management concepts.

Source of Funds

Smith-Lever; National Endowment for Financial Education

Scope of Impact

Dissemination – The programs are available to all public and private school students as well as home schooled students. The HSFFP is available to all county Extension agents, who decide if this will be a part of their annual plan of work. These materials can be ordered at no charge from the National Endowment for Financial Education. The county agent, the classroom teacher or both together teach the HSFPP. Other youth financial management programs are taught by the county agent to the children or delivered through a trained volunteer.

Scope of the Program – Counties conducting the High School Financial Planning Program include Baxter, Benton, Boone, Bradley, Clark, Cleburne, Craighead, Crawford, Crittenden, Cross, Desha, Faulkner, Garland, Grant, Greene, Hempstead, Jackson, Jefferson, Johnson, Lawrence, Little River, Lonoke, Madison, Miller, Mississippi, Nevada, Perry, Poinsett, Pope, Prairie, Pulaski, St. Francis, Sebastian, Washington, White and Yell.

KEY THEME: FARM SAFETY

Program Response: Farm Safety Programs and Farm Accident Rescue Workshops

Contact: Gary Huitink, 501-671-2237, Biological and Agricultural Engineering

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 construction. They estimated that 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 may vary from this, but the cost of most items, including medical care, has risen since 2000. Injuries and accidents often become more traumatic when individuals work alone, sometimes in areas distant from any medical care facility.

Stakeholder Input

Farm safety concerns reach us from program planning activities. Accidents are traumatic for the victim and his family. Costs to the victim have become high, and employers are interested in mitigating lost time, impaired employees, insurance premiums and potential litigation.

Overview

A variety of activities helped to reduce farm injuries and fatalities in Arkansas this year. Educational programs and publications have been delivered. Some counties emphasized farm youth safety, including several Progressive Farmer Kids' Day Camps. Four counties conducted a one-day program, "Farm Safety and Legal Responsibilities." Ginners and gin workers attended one of four programs addressing electrocution hazards and serious falls.

Another approach employed 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 with Arkansas Farm Bureau and the Cooperative Extension Service.

Extension Program Results and Accomplishments

Output indicators

156 Rescuers that participated in two Friday night/Saturday Farm Accident Rescue workshops.

500 Farm owners, managers, workers, consultants and safety personnel that participated in meetings specifically on farm safety topics, including a one-day program, "Farm Safety and Legal Responsibilities," conducted in four counties.

– Over 6,000 safety fact sheets distributed at Cooperative Extension Service training sessions and meetings.

– Over 360 gin owners, managers and workers participated in joint training conducted by Cooperative Extension Service and the Southern Cotton Ginners' Association.

– "Common Agricultural Hazards in Arkansas" topic was added to the CES web site and "Identify Hazards and Prevent Accidents" was included in the Corn Handbook for emphasizing managing safely during corn production.

Outcome Indicators

– The number of reported Arkansas farm fatalities declined from 19 in 1999 to 18 in 2000 and down to 14 in 2001, 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.

– Several rescue units in Arkansas have added air bags to their rescue tools, in addition to having training to get the victim to medical care more rapidly.

– Other states have inquired about patterning a rescue training program in their state after the model developed in Arkansas.

Source of Funds

Smith-Lever, Federal Farm Safety Cooperative Extension Service grant

Scope of Impact

Dissemination – Statewide constituents have access through county offices, and anyone accessing our Cooperative Extension Service web site receives some benefits. "Common Agricultural Hazards in Arkansas" was a topic added to our web site this year. A management guide, "Identify Hazards and Prevent Accidents," chapter 11, emphasized safe workplaces in the new publication, *Corn Handbook*. 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. National safety specialists heard a presentation, "Agricultural Hazards and Educational Approaches in Arkansas," at the National Institute of Farm Safety.

Scope of Program – Farm Accident Rescue training programs were conducted in White and Hempstead counties.

KEY THEME: IMPACT OF CHANGE ON RURAL COMMUNITIES

Program Response: Planning for Economic Development

Contact: Wayne Miller – Agricultural Economics and Community Development, 671-2085, wmiller@uaex.edu

Situation

Economic opportunity and quality of life vary greatly depending on your access to a good education, high-quality health care, employment opportunities and where you live. Even with a good education, many residents must move to an urban area or move out-of-state to obtain high-paying jobs.

- The Arkansas economy received a "D" for performance on its 2002 report card published by the Center for Economic Development, while it received an "F" in Business Vitality and an "F" in Development Capacity. This suggests that there is a considerable need for improving the economic conditions in Arkansas.

- Arkansas ranked 50th among states in a "New Technology" report card recently released, which suggests that Arkansas needs more information technology infrastructure, a larger skilled labor force and more "high tech" businesses.

- Near half of Arkansas' 75 counties (37) lost population during the past year. Most counties in the Delta, Coastal Plains and Ouachita Highlands lost population, while the metropolitan areas and much of the Ozark Highlands gained population.

- The earnings per job – in real terms – continued to decline in many Arkansas counties.

Arkansas needs to invest in the building blocks of economic development – education, health care and information technology infrastructure – at a time when state and local government revenues are declining in an anti-tax and anti-government environment.

Stakeholder Input

Requests for these programs come from community leaders.

Overview

Communities that survive and grow in today's competitive environment are continually searching for ways to improve their communities and the lives of their citizens. The Economic and Community Development section helps communities identify, evaluate and implement economic development strategies through workshops, community surveys, community profiles and impact studies.

Extension Program Results and Accomplishments

Output Indicators

- Prepared and distributed County Profiles for all 75 Arkansas counties.

- Prepared a 2003 Rural Profile of Arkansas for state legislators and community leaders.

- Conducting a retail trade and service sector survey in Bradley County to identify new retail trade and service sector opportunities in the county

- Provided Hope city officials with a study of the feasibility of an Amtrak stop in the city.

- Conducted an economic impact assessment of the Booneville Memorial Hospital.

- Completed an economic impact assessment of the Tellico Village recreation/retirement community.

- Provide Benton County Judge and Quorum Court members with a study of the economic impact of agriculture on the county.

Outcome Indicators

- The Hope city officials used our report in their presentations to Amtrak to request that the Texas Eagle stop in their city. The request is on hold, depending on Amtrak's request for more funding from the federal government.

- The Booneville community passed a city sales tax in support of the hospital. City officials said they used our study to explain the contribution of the hospital to the local economy.

Source of Federal Funds

Funding was obtained from the beneficiaries of the studies as well as from CES 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 website.

Scope of Program – Many communities have used our questionnaires in conducting their community surveys. Community and state leaders have used the County and Rural Profiles in planning their community programs. However, we provide some of these services to rural communities primarily because they do not have the resources to undertake these activities without outside assistance.

KEY THEME: PARENTING

Program Response: Guiding Children Successfully

Contact: H. Wallace Goddard, Family Life Specialist, Family and Consumer Sciences, 501 671-2104, wgoddard@uaex.edu

Situation

American families face unprecedented challenges. The frustrations and demands of a fragile economy, heavy work schedules, stress overload and personal uncertainties put a heavy load on American parents. The problems are further aggravated by the lack of training in dealing with personal and family issues. The need for solid, practical, research-based information for parents 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 are desperate for information yet are unsure where to get information that is reliable. While good parenting may be the most important work that any society can do to assure its future, it is estimated that 90 percent of parents undertake the task without any specific training. A meeting of Family and Consumer Sciences 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 uaex web site 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 2002. 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 Family and Consumer Sciences 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**. Each show is an hour-long program that includes practical tips for parents and includes both panelists and field footage. 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. **Guiding Children Successfully** focuses on providing parents and other caregivers with practical, sensible information to help children develop into healthy, contributing adults.

Extension Program Results and Accomplishments

Output Indicators

Supported by extensive media coverage (for example, the cover of the Arkansas television guide), the programs first aired on September 22 through 26, 2002. They were re-broadcast in December and are scheduled to air with five additional shows in Spring, 2003. All shows will be put into periodic rotation in the AETN schedule. In addition, videotapes of all programs are being made available to all county offices for use in community programs.

Outcome Indicators

Guiding Children Successfully has enjoyed a very positive reaction in Arkansas. Five additional shows are being created. The original five together with the new shows will air in Spring 2003. In addition, National Educational Telecommunications Association (NETA) has adopted **Guiding Children Successfully** and began flowing the show to a national audience in February, 2003. While it is not possible to determine the exact number of households reached by the shows, AETN has an average weekly viewership of about 237,000 households, or about 540,000 viewers. Since the show did not air during a ratings month and AETN does not subscribe to A. C. Nielsen, it is not possible to give exact numbers of viewers. However, AETN has aired the show during their primetime (6:00 p.m.) and has re-broadcast the shows. It is reasonable to estimate that hundreds of thousands of viewers have been reached.

Source of Funds

Smith Lever for all Extension planning, filming and producing. AETN has absorbed all of their production and broadcast costs

Scope of Impact

Dissemination – Guiding Children Successfully has enjoyed a very positive reaction in Arkansas. Five additional shows are being created. The original five, together with the new shows, will air in Spring 2003. In addition, National Educational Telecommunications Association (NETA) has adopted **Guiding Children Successfully** and began flowing the show to a national audience in February, 2003.

Scope of Program – Guiding Children Successfully is focused on helping all caregivers be more effective in their interactions with children. The show has been useful not only for parents but is becoming increasingly popular with childcare providers and school teachers with regular audience participation by groups such as the Little Rock School District and Arkansas Cares Drug Treatment and Rehabilitative Services.

Program of Excellence

The fact that the National Educational Telecommunications Association (NETA) has chosen **Guiding Children Successfully** to offer to a national audience is tribute to the quality of the content and production. This effort provides Cooperative Extension with a diverse and substantial audience both statewide and nationally.

General Program Information – The first five shows for the series were taped between May 2002 and September 2002. Each topic was carefully selected based on a survey of needs that included both Extension and AETN personnel. The first five shows and a short description follow:

GCS 1: Effective Motivation
How can I get that kid to do the job? This show teaches how to cultivate self-motivation in children. There are surprises in the factors that motivate children. The first factor is love. Children respond most readily to people who care about them. The second factor is knowledge. Very often children "misbehave" simply because they do not know any better. The third factor is compassion. Our compassion helps children cultivate their own appreciation for other people.

These three factors work together to help children become motivated – even self-motivated – to be helpful, caring and respectful. This show provides

practical helps for any adult who is interested in motivating a child.

GCS 2: Guiding Children With Love and Good Sense

Our common ways of guiding children are often very ineffective. Spanking often results in sullenness; time-out may create resentment. What is a parent or caregiver to do? This show teaches how to set children up for success using proactivity, understanding, positivity and redirection. We can also make sure that our responses are more focused on teaching children than making them suffer.

Anyone who works with children will be glad for these good ideas to make our relationship more positive while guiding children successfully.

GCS 3: Teachers and Parent Working Together

Teachers and parents are some of the most important people in children's lives. When they work against each other, children suffer. When they work together, children prosper.

There are things that parents can do to help their children with emotions, nutrition and sleep. Routines, media and reading are also vital in children's development. There are things teachers can do to support parents. And there are ways that teachers and parents can work together that make learning a vital part of children's lives.

GCS 4: Teaching Children Responsibility

Are children learning to do chores and take responsibility? What is reasonable to expect of children? In recent decades, children have usually not been required to contribute to the family economy. Many people worry about a generation of children who seem to take no responsibility. This show underscores the idea that every member of the family has obligations for the welfare of the family. Adults can encourage responsibility in children through their example, by providing reasonable responsibility at home and by encouraging children to help in their community. There are sensible ways to cultivate responsibility in children

GCS 5: Helping Children Use Their Gifts

Research over the last few decades has shown that traditional ideas of self-esteem are not the key to well-being. In fact, high self-esteem is sometimes dangerously close to self-centeredness. Yet it is clear that self-hate is not the answer. Fortunately, we have discovered good ways to raise balanced, healthy children. We can help children discover their own gifts, appreciate others' gifts and use their gifts to make their communities better places. The new emphasis on gifts is good for children, good for families and good for communities.

The second set of five shows has been taped and, together with the first five, will be broadcast statewide in Spring 2003. The shows will be put into regular rotation

Location – AETN has a statewide reach. Between the broadcast of the program and availability of the tapes to Extension agents, the show has reached all 75 counties in Arkansas.

Impact Numbers – AETN has an average weekly viewership of about 237,000 households, or about 540,000 viewers. Since the show did not air during a ratings month and AETN does not subscribe to A. C. Nielsen, it is not possible to give exact numbers of viewers. However, AETN has aired the show during their primetime (6:00 p.m.) and has re-broadcast the shows. It is reasonable to estimate that hundreds of thousands of viewers have been reached.

A regular feature of each show is directing viewers to the excellent Extension resources at arfamilies.org .

CES Section Contact Person: H. Wallace Goddard, Family Life Specialist, Family and Consumer Sciences, 501 671-2104, wgoddard@uaex.edu

KEY THEME: WORKFORCE PREPARATION

Program Response: Mini-Society Camp

Contact: Mike Klumpp, 4-H Youth Development, mklumpp@uaex.edu

Situation

According to the Arkansas Department of Education, 59 percent 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 percent 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 Mini-Society program combines several educational skills, including math, in an experiential manner, and likewise introduces the concepts of entrepreneurship and economics to the students.

Stakeholder Input

Evaluations from the previous year's mini-society 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 Mini-Society 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 Mini-Society 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 – four days and three nights

102	Youth, ages 9-12, who participated in the state camp.
2,856	Hours of educational instruction during the Mini-Society Camp.
15	Adults trained to implement the Mini-Society Program.
8	Counties implemented Mini-Society program at the county level.
384	Youth participated in the Mini-Society program at the county level.
9,216	Hours of educational instruction in county Mini-Society programs.

Outcome Indicators

County Programs

- 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.

- Youths learned about partnerships and working together in groups.

Mini-Society Camp

- 87 percent of the participants rated their Mini-Society Camp as either "Good" or "Great" (59 percent).

- 50 percent of the participants had never been to an overnight camp.

- When asked what they had learned during the Mini-Society Camp, students' responses included:
  - Money and jobs.
  - Spend money wisely.
  - How to respect people.
  - Running a business is hard.
  - People don't always think the way you do.
  - How to own a business.
  - How to cooperate, scarcity and market mechanisms.
  - How to canoe.
  - Keeping up with money and how hard it is to be the president.
  - How to budget money wisely and how to work with others.
  - Starting and running your own business.
  - How to learn from your mistakes and that making decisions isn't always easy.
  - Business ethics.
  - Teamwork and how to run a shop.
  - Learned more responsibility.
  - Building your own business is hard work.
  - You don't have to be lonely and that there is nothing wrong if you get in trouble.
  - Never to give up and follow your dreams.
  - Sharing.
  - How to save your money and spend it wisely.

Source of Funds

Funds for the Mini-Society program came from the Marion Kauffman Foundation for Entrepreneurial Leadership. A grant of $20,000 each were obtained to conduct training and to implement the program. Participants paid a $40.00 fee for camp.

Scope of Impact

Dissemination – The Mini-Society 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, 501-671-2225, 4-H Youth Development, 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 percent 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 3 percent of the population is directly involved in agricultural production yet about 25 percent 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 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

9 Number of programs held at the agricultural awareness center.

20 Number of outreach programs held through the state.

600 Number of participants in agricultural awareness workshops at Forestry and Wildlife and County Camps.

3,500 Number of participants in Pizza Ranch and Insect Festival.

Outcome Indicators

- Doubled the numbers of counties and school districts participating in field trips and outreach programs.

Source of Funds

50 percent University of Arkansas at Pine Bluff (UAPB), 50 percent University of Arkansas Cooperative Extension Service (CES), $5,000 grant from EPA

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, Prairie, Cleveland and Jefferson.

Program Response: Citizenship Washington Focus

Contact: Cynthia Klumpp, 4-H Youth Development, (501) 671-2059, cklumpp@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 (CYWF) 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

47 Arkansas 4-H members, two volunteer leaders and two county Extension agents attended the nine-day CYWF trip to Washington, DC.

6,121 Arkansas youth received citizenship education according to the ES-237 report.

Outcome Indicators

27 Delegates improved their citizenship competency scores as measured by pre- and post-testing.

47 Delegates turned in a plan of action of what they planned to do in their local community as a result of the CYWF 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.

Scope of Program – Participants in this program represented 24 Arkansas counties: Arkansas, Ashley, Benton, Craighead, Crawford, Cross, Faulkner, Garland, Hempstead, Howard, Independence, Jackson, Jefferson, Johnson, Logan, Lonoke, Madison, Pope, Prairie, Saline, St. Francis, Union, Washington, and White.

Program Response: Developing Youth

Contact: Darlene Z. Baker, State Leader – 4-H Youth Development, dbaker@uaex.edu, (501) 671-2064

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 percent of the population, they represent 100 percent 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 percent 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, provide leadership development and focus on life skills enhancement through research-based educational programs focusing on Family and Consumer Sciences,

Science and Technology, Community and Economic Development, Agriculture and Natural Resources.

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

5,633	Number of clubs/units in which youth participated.
778	Number of organized clubs/units in which youth participated.
116,483	Number of youth who participated in clubs/units.
10,939	Number of youth who participated in organized clubs/units.
8,558	Number of youth who participated in competitive activities.
3,849	Number of educational programs held for youth that target basic life skills.
55,929	Number of youth who participated in educational programs designed to teach basic life skills.
1,869	Number of educational programs targeting social competency life skills for youth.
25,292	Number of youth who participated in educational program designed to promote social competency.
1,383	Number of educational programs designed to give youth and adults the opportunity to work together.

Outcome Indicators

32,931	Number of youth who reported working in one or more educational project areas.
20,146	Number of youth who reported completing one or two educational project areas.
2,987	Number of youth who reported completing three or more educational project areas.
18,484	Number of youth involved in educational programs who report they have adopted at least one new recommended skill/practice.
18,655	Number of youth involved in educational programs who report they have changed one or more practices as a result of the educational program.
8,482	Number of youth who report improved decision making skills.
2,925	Number of youth who report improved record keeping skills.
5,295	Number of youth who report improved communication skills.
8,670	Number of youth who report improved relationships with peers.
5,629	Number of youth who report improved relationships with parents.
5,705	Number of youth who report improved relationships with non-parental adults.

5,798 Number of youth who report improved conflict management skills.

7,376 Number of youth who report improved character behaviors.

3,733 Number of youth who report improved planning and organizing skills.

2,227 Number of youth volunteers conducting educational programs.

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.

Scope of Program – All 75 counties in Arkansas.

Programs of Excellence

Strengthening 4-H

The agent wanted to make "strengthening the Poinsett County 4-H Program" an early focus. 4-H leaders and the 4-H Foundation shared this vision and established the following goals in a planning session:

- Increase 4-H membership.
- Increase 4-H recognition in the community.
- Increase the number of adults who were involved in the program.

General Program Information – A series of four workshops focused on 4-H program areas was developed. Through a series of newspaper articles and personal contacts, the youth in the county were invited to join in. Harrisburg High School was receptive to our ideas and allowed us to use their facilities. Area businesses made donations for some of the supplies, and the balance were provided by the 4-H Foundation.

The first workshop was constructing birdhouses in the high school agriculture building. Workshops for sewing, baking and scrapbooking were held in the Family and Consumers Sciences Building. Participants made aprons, baked cookies and zucchini bread and made memory pages. Community service was tied to the workshops by contributing birdhouses to the Lake Poinsett State Park, taking cookies to the Senior Citizen Center and making fabric bears for the Health Department. A nutrition segment was presented and taught by the Family and Consumer Sciences agent at each workshop.

Locations Involved – Poinsett County

Impact Numbers

- Increased 4-H membership in community clubs from 11 to 24 (increase of 118%).
- Acquired the support of local merchants and school officials.
- Recruited the help of ten adults from EHC, school faculty and the community. Three have become adult volunteers.
- Gained recognition in the community through a series of five newspaper articles spotlighting the workshops and participants.
- Allowed several youth the opportunity to participate in the county fair for the very first time.
- Leaders made a commitment to attend 4-H Core Competency Training.

CES Section Contact Person: Debra DeRossitte, County Extension Agent - Family and Consumer Sciences, 870-578-4490, dderossite@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

3,540 Participants participated in the program in 2002.

130 Activities with 3,540 participants (4 or 8 hour Challenge course programs).

Outcome Indicators

Program growth reflects the success and broad appeal of the ExCEL program:

- 1997-98 1,550
- 1998-99 2,800
- 1999-00 2,900
- 2000-01 3,500

Source of Funds

Funding for the ExCEL program is from the Cooperative Extension Service, University of Arkansas 4-H Foundation and participant fees. This year grant funds were secured from Nature Mapping, Arkansas Game and Fish, Forest Service 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)

Contacts: Burnett L. Kessner, 4-H Youth Development, 501-821-6884, bkessner@uaex.edu; Leslie H. Gall, 4-H Youth Development, 501-821-6884, lgall@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 home schooling mom really appreciates all of you!" Betty Ray, Home school parent commenting on the first grade SEEK class.

Overview

4-H Responsible Environmental Stewardship - Quest (4-H RES-Q) allows students to experience the out-of-doors and provides 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 school and youth group environmental education field trips, Science Enrichment Education for Kids (SEEK) and Youth Environmental Specialty Workshops. 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 mission of the 4-H Responsible Environmental Stewardship-Quest Program is:

- 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.

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. Educators select from 16 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 Not On Drugs – 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, and several other topics.

Youth Environmental Specialty Workshops

These workshops were started to provide high school youth with the opportunity to learn about Arkansas wildlife, specifically in 2002, Rocky Mountain elk and aquatic ecology. The elk workshop was held on the Buffalo National River where the youth studied the biology of the elk and how elk differ in habitat needs compared to the white-tailed deer. The participants were introduced to wildlife management techniques at the Gene Rush Wildlife Management Area and how the Arkansas Game and Fish Commission is currently working with the private landowners in the Newton County area. Each participant had the opportunity to take a content test at the end of the workshop to compete for three scholarships: two $1,000 and one $400. The aquatic workshop was held at Lake Nimrod where the youth studied fisheries management, aquatic ecosystems, boating education and leadership skills. Each participant had the opportunity to take a content test at the end of the workshop to compete for three scholarships: two $1,000 and one $600.

Science Enrichment Education for Kids

The 4-H RES-Q Science Enrichment Education for Kids program, SEEK, began in the fall of 1999. The program was established to help meet the science needs of home-schooled 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 14 weeks during 2001/2002 and 12 weeks during 2002/2003. The program currently has one first grade, two second grade, three third/fourth

grade, three fifth/sixth grade, three seventh/eighth grade, and one ninth through twelth grade class.

Nature Mapping

A two-year pilot program is being conducted, beginning with the 2002/2003 SEEK program, incorporating Nature Mapping curriculum. High School age students meet once per week during the 12-week program to study natural resource management topics, mapping, GIS/GPS technology and leadership skills.

Extension Program Results and Accomplishments

Output Indicators

9,209	Number of participants in the 4-H RES-Q program at the Arkansas 4-H Center, March through November.
34	Number of participants attending the four-day Youth Environmental Specialty Workshops, June and July.
150	Number of participants in the 14-week 4-H RES-Q Science Enrichment Education for Kids program during the winter of 2001/2002.
187	Number of participants in the 12-week 4-H RES-Q Science Enrichment Education for Kids program during the winter of 2002/2003.

Source of Funds

4-H RES-Q is a youth development program of the Cooperative Extension Service, University of Arkansas, 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, Rocky Mountain Elk Foundation, Nucor Steel, Nucor Yamato Steel and numerous organizations, industries and individuals from across the state.

Scope of Impact

Dissemination – 4-H RES-Q is 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 program is based at the Arkansas 4-H Center with some workshops facilitated in other parts of the state. We have participants from Ashley, Benton, Craighead, Conway, Faulkner, Garland, Grant, Hot Spring, Jackson, Jefferson, Lawrence, Little River, Lonoke, Mississippi, Newton, Perry, Poinsett, Pope, Pulaski, Saline, Scott, Van Buren, Washington, White and Yell counties in one or more of the 4-H RES-Q sections.

Programs of Excellence

4-H 6th Grade Retreat – Camp RES-Q

Eight hundred sixth graders, teachers and youth mentors from four Jonesboro school districts participated in a one day camping event at the 4-H Center.

General Program Information – A committee was formed consisting of the sixth grade administrators from the schools involved. The 4-H camping program was explained and a video of the 4-H Center shown. A meeting was then held with the teachers to explain the program and answer their questions. If a principal requested, we then held a meeting with the parents.

Dates and activities were booked with the 4-H Center. Since we wanted to focus on developing outdoor leisure activities, we chose canoeing, fishing, hiking, adventure games (team building) and water cycle as the classes for the students. The evening program consisted of a campfire program and Critter Olympics (games). All activities emphasized the need to work as a team and to focus on each other.

A letter was sent to all parents containing information about the 4-H Center and what the kids could expect from the trip. A health release form and a code of conduct were also sent home. Parents were encouraged to phone the Extension office if they had any concerns or questions. A second letter was sent home a few days before the trip with emergency information and a list of what to bring to camp.

A total of 800 students, teachers and mentors attended camp in seven different groups.

Locations Involved – Sixth grade students from four school districts attended an overnight retreat at the Arkansas 4-H Center in Little Rock. The students came from the following Jonesboro area school districts: Westside, Nettleton, Jonesboro and Valley View. All students were eligible to attend. Classroom teachers and principals accompanied the group as well as one teen mentor for every 10 students. A training session was held for mentors on how to work with the youth.

Impact – Approximately 30 days were spent developing this program. There were seven groups of students brought to camp for one night. A total of 800 students, mentors and teachers attended. They arrived at 11:00 a.m. and left the following day at 12:00 noon. Many of the students experienced new things such as fishing and canoeing. For many this was the first time they had been to camp. Most students wanted to stay longer. Funding for the program was received though a Safe School Grant. The total cost of the program was $52,000.00.

Students were surveyed on their perceptions of the retreat on the day after they returned to school. Survey items focused on three themes:
(1) educational value of the retreat, (2) the development of important skills (teamwork, cooperation, communication) and (3) how much the students enjoyed the retreat. Each of these three areas is in line with the goals of the activities. The majority reported they had learned a lot during the retreat (80 percent), and 73 percent reported that they learned how water affects plants, animals and people. Many students reported that the retreat helped them to develop better skills. For example, 71 percent reported that they learned how to cooperate better with other students, and 56 percent reported the retreat taught them how to become better problem solvers. Overall, the students enjoyed the retreat (95 percent) and reported that they would recommend it to other students (89 percent).

CES Section Contact Person: Martha May, County Extension Agent - Family & Consumer Sciences (Craighead County), 870-933-4565, mmay@uaex.edu

Program Response: Kansas City 4-H Global Conference

Contact: Kevin Jones, 4-H Youth Development, 501-821-6884, kjones@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

37 Arkansas 4-H members who attended the four-day Kansas City Global Conference in Kansas City, Missouri.

120 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. Two of these members were selected to serve as facilitators for the Global Conference.

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.

Scope of Program – Participants in this program represented 16 counties from across the state: Ashley, Benton, Columbia, Cross, Faulkner, Garland, Independence, Jefferson, Johnson, Polk, Pope, Prairie, Pulaski, Sebastian, Washington, White.

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 exhibits 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.

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 is held on the University of Arkansas - 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, the Bumpers College picnic lunch and attend the Awards of Excellence Banquet.

Extension Program Results and Accomplishments

Output Indicators

Regional O-Rama

161 Number of Extension agents that attended the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

31 Number of Extension paraprofessionals that attended the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

142 Number of specialists conducting activities and others attending at the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

197 Number of 4-H leaders that attended the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

655 Number of junior 4-H'ers competing in activities at the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

411 Number of senior 4-H'ers competing in activities at the Southeast, Southwest, Northeast and Northwest Regional O-Ramas.

Arkansas 4-H O-Rama

83 Number of Extension agents that attended State O-Rama.

17 Number of Extension paraprofessionals that attended State O-Rama.

45 Number of specialists that conducted activities and attended State O-Rama.

69 Number of 4-H leaders that attended State O-Rama.

451 Number of 4-H'ers from the Southeast, Southwest, Northwest and Northeast districts that attended State O-Rama.

Outcome Indicators

- Numerous newspaper articles from around the state promoting 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

Contact: Kevin Jones, 4-H Youth Development, 501-821-6884. kjones@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

Five state camps designed for county 4-H youth participation (ages 9-12), and one for youth (ages 13-16) were conducted at the Arkansas 4-H Center during June and July. The camping program used Summer Fellowship Counselors and 4-H Teen Counselors in Training 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 Counselors in Training volunteers were provided with a three-day intensive counselor training that helped to prepare them for their duties and responsibilities. Camps was designed around the theme "4-H – 100 Years of Success," which introduced campers to a wide variety of 4-H educational subject matter. 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.

Extension Program Results and Accomplishments

Output Indicators

9	Summer Fellowship Counselors
20	4-H Teen Counselors in Training
25	State Camp – Expanding Horizons
98	State Camp One
90	State Camp Two
205	State Camp Three
93	State Camp Four
40	Adventure Challenge Camp
551	Total number of campers
36	Counties whose youth participated in State Camp
10,150	Hours of camper educational instruction time
3,126	Hours of camper recreational time

Outcome Indicators

70%	Rated camp great
22%	Rated camp good
8%	Rated camp OK
62%	Rated educational workshops great
25%	Rated educational workshops good
12%	Rated educational workshops OK

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 Counselors in Training positions.

Scope of Program – The program was used by 36 Arkansas counties.

Program Response: Youth Leadership

Contact: Cynthia Klumpp, 4-H Youth Development, cklumpp@uaex.edu, 501-671-2059

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 percent of the population, they represent 100 percent 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 FY02, 73 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. Sixty-seven ambassadors and six 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 2002, the conference focused on the power of youth/youth as partners. Participants included 191 youth and 16 adults.

Extension Program Results and Accomplishments

Output Indicators

932	Number of educational programs for youth focusing on youth leadership/volunteer development.
6,320	Number of youth participating in youth leadership/volunteer development programs.
4,884	Number of new youth participants in leadership and volunteer programs.

Outcome Indicators

2,227	Number of youth volunteers conducting educational programs.
25,284	Number of volunteer hours contributed by youth to educational programs.
1,027	Number of youth in new volunteer leadership positions.

1,508 Number of youth in new elected leadership positions.

6,064 Number of youth volunteers trained through 4-H.

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.

Scope of Program – Thirty-two counties had youth serve in a state 4-H ambassador or state 4-H officer leadership role including Cleburne, Independence, Johnson, St. Francis, Baxter, Benton, Crawford, Faulkner, Madison, Pope, Searcy, Sebastian, Washington, Jefferson, Prairie, Pulaski, Clark, Columbia, Garland, Hot Spring, Pike, Cross, Fulton, Grant, Jackson, Nevada, Polk, Sevier, Sharp, Yell and Union.

Programs of Excellence

4-H Teen Retreat

Agents spent a total of 8 days on this project. The 22 youth were able to participate in games to develop teamwork and decision-making skills. The one-night/two-day program was a great way for them to get away to camp, gain a better understanding of other 4-H teens in the county and learn to work together to accomplish goals. Educational activities were designed to be fun while developing life skills.

General Program Information – Retaining 4-H members as they become teenagers is a challenge in most 4-H programs. Polk County loses 4-H members ages 12-14 at an alarming rate when they have to choose between 4-H or other extracurricular activities.

A 4-H Teen Retreat was organized to help develop leadership skills and to provide an activity exclusively for teenagers. All 4-H members ages 13 and up were invited to participate in a one-night retreat staffed only by an agent and three collegiate 4-H/FFA members. Youth came from all clubs in the county. Teens were treated with respect and trust. They were allowed to set their own rules and curfew at the camp.

Locations Involved – Polk County.

Impact – The 22 youth who participated in the Teen Retreat came away from the activities with a better appreciation for the 4-H program and a better sense of teamwork. They worked to accomplish a list of agenda items at their own pace. They chose to work hard to get the items finished so they would have a longer time to participate in games and activities. They formed a Teen Council to represent teen leadership in the county. They chose to sponsor a Leaders' Reception and a Cloverbud Camp for young 4-H members. One of these members was elected as Southwest District 4-H Vice President this past summer. Others have continued to be active in their 4-H clubs.

CES Section Contact Person: Carla Vaught, County Extension Agent – Staff Chair (Polk County), 479-394-6018, cvaught@uaex.edu

Program Response: Youth Community Service

Contact: Cynthia Klumpp, 4-H Youth Development, cklumpp@uaex.edu, 501-671-2059

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 percent of the population, they represent 100 percent 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 parents 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

1,068 Number of community projects implemented by youth.

6,121 Number of youth who participated in community service projects.

3,099 Number of youth volunteers conducting community service programs.

4,760 Number of volunteer hours expended on the 4-H CAN Make a Difference food bank program.

39,426 Pounds of food collected via the 4-H CAN Make a Difference program.

Outcome Indicators

3,815 Number of youth who reported spending one or more hours a week in providing service to their community or others.

98,355 Number of volunteer hours contributed by youth to community service programs.

$1,622,857.50 Value of volunteer hours contributed by youth to community service programs.

Source of Funds

Smith-Lever 3b and 3c provide support for professional. 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, 29 counties submitted written reports. These counties were Benton, Boone, Clark, Craighead, Desha, Grant, Greene, Howard, Independence, Izard, Jefferson, Johnson, Lawrence, Little River, Lincoln, Logan, Madison, Marion, Miller, Ouachita, Pike, Pope, Prairie, Saline, Searcy, Sebastian, Sevier, Sharp and Yell. In addition, food was collected at the Arkansas State Fair, and 11 state or district events.

Programs of Excellence

Gould Public School Beautification 4-H Project Club

General Program Information – Many of the children in Southeast Arkansas are not afforded the opportunities that children in other areas have. Many children in Lincoln County attend schools that are 90 to 100 percent minority. These school districts have very limited resources and are not able to give the children extracurricular activities. The typical child in these areas either lives with a single parent or is being raised by grandparents. 4-H is a perfect fit for these children. A school project club was formed with a sixth grade class in Gould. The group chose a focus of school beautification.

Location – One county, Lincoln, was involved in the community of Gould.

Impact Numbers – Ninety-five percent of the youth involved felt "very proud" of what was accomplished. Material and plants for a greenhouse were donated to the project (value of over $400.00)

CES Contact Person: Sunny Wilkerson, County Extension Agent - Agriculture, 870-628-4247, swilkerson@uaex.edu

4-H CAN Make a Difference

A third grade 4-H member stated that helping work in the food bank and measuring out the bulk food has helped her with her math. She said that having to count the number of cups poured in the bags helped her to better understand the difference between whole numbers and fractions, and what it takes to make a pint or quart.

General Program Information – The Arkansas 4-H CAN Make a Difference was a statewide community service program designed to collected nonperishable foods for the Arkansas Food Bank and other similar groups throughout the state. In Arkansas there is a need to provide food for the hungry, especially during "non-holiday" times. Each county Extension office was furnished with posters for collection sites and informational materials on the hungry in the state. 4-H clubs then accepted the responsibility to collect canned goods and other nonperishable foods. In addition, many 4-H members donated time to work in local food banks.

Location – Most counties participated in the program at some level. Twenty-nine counties submitted results of the program. These counties were Benton, Boone, Clark, Craighead, Desha, Grant, Greene, Howard, Independence, Izard, Jefferson, Johnson, Lawrence, Little River, Lincoln, Logan, Madison, Marion, Miller, Ouachita, Pike, Pope, Prairie, Saline, Searcy, Sebastian, Sevier, Sharp and Yell. In addition, food was collected at the Arkansas State Fair, and 11 state or district events.

Impact Numbers – Over 39,000 pounds of food were donated by Arkansas 4-H members to the Arkansas Food Bank. The 4-H program was the third largest donor in the state to the Food Bank. 4,760 volunteer hours were expended on this project.

Contact Person: Brian Helms, 4-H Youth Development, 501-671-2289, bhelms@uaex.edu

Management Goal – Information Technology

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 groups, there are many Arkansans who will not leave their homes to attend workshops. By reaching them through mass media, Extension extends its educational efforts into thousands of homes.

Stakeholder Input

The content broadcast is provided by content specialists and reflects the programmatic focus of agriculture, horticulture, family and consumer sciences and 4-H and youth. Commercial television and radio stations provided input as to the content needed to reach audiences based upon Arbitron ratings and upon situations which occur that affect the lives of Arkansans.

Overview

Using the power of mass communications, the Cooperative Extension Service quickly disseminates research-based and timely information to Arkansas throughout the state through broadcast and electronic media. The communications 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 University of Arkansas Cooperative Extension Service worked with commercial television and radio stations in the Little Rock region and partnered with KUAR 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. 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.

- Production Agriculture
- Horticulture
- Row Crop
- Beef Production
- Environmental Practices
- Public Policy Issues
- Rural Community Development
- Recycling
- West Nile Virus
- Family Life Issues
- Food Safety and Nutrition
- Child Care Providers
- Parents
- 4-H and Youth Development
- Financial Planning

Extension Program Results and Accomplishments

Output Indicators

60 Radio news releases and public service announcements produced and distributed statewide through radio and posted on RadioSource, a national web-based radio outlet developed as a multi-state effort; the site is managed by the Florida Cooperative Extension Service.

94 Appearances by content specialists on statewide commercial television.

35 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.

46 Radio spots produced and aired on KUAR and KLRE public radio affiliated broadcasting stations housed at the University of Arkansas at Little Rock. Topics included information on healthy weights, nutrition, West Nile Virus, personal and family health, youth development, pet and animal care, horticulture and agriculture.

12 Today's Garden, a program about horticulture and gardening and aimed at people who are involved in gardening, was produced and delivered to the Arkansas Educational Telecommunications Network where it was broadcast statewide each month.

Outcome Indicators

50,000 Households that watch AETN during the 6:30 p.m. time slot when Today's Garden is broadcast; the audience is primarily female, middle age to elderly, college educated.

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 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 grants

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 and 4-H and youth development.

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 which 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 feature 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. Feature 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 the news outlet. Photographs are posted electronically with the news stories for downloading by news outlets. Articles range each week, covering current issues in agriculture, family and consumer sciences, community development and 4-H and youth development.

Extension Program Results and Accomplishments

Output Indicators

54 Feature 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 approximately 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.

35 Approximate number of spot news stories that are distributed statewide for use by weekly and daily newspapers.

Outcome Indicators

31 Daily newspapers print articles prepared, pitched and distributed by the University of Arkansas Cooperative Extension Service.

107 Weekly newspapers print articles prepared, pitched and delivered by the University of Arkansas Cooperative Extension Service.

614,000 Number of households in Arkansas subscribing to daily newspapers in Arkansas; the articles distributed to the daily newspapers are accessible to the households that subscribe.

294,319 Number of households in Arkansas subscribing to weekly newspapers in Arkansas; the articles distributed to weekly newspapers are accessible to the households that subscribe.

All articles are accessible on the University of Arkansas Cooperative Extension Service web site as well.

12,600 Number of newspaper clips, which indicates the number of times articles appear in print in the weekly and daily newspapers during the year statewide.

Source of Funds

Federal, state and grants

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 science, 4-H and youth development and community development.

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 which 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.

Titles of the fact sheets include:

- Agricultural Aviation Security
- Factors Affecting Fat Percent in Milk of Lactating Cows
- Tattooing of Cattle and Goats
- Rhizoctonia Large Patch of Zoysiagrass and Bermudagrass
- Gray Mold, A Silent Strawberry Nemesis
- Control Root-Knot Nematodes in Your Garden
- Stocker Cattle and Soft Red Winter Wheat Production Systems
- Black Spot of Rose
- Hazardous Household Products
- Strawberry Production in the Home Garden
- Blueberry Production in the Home Garden
- Blackberry Production in the Home Garden
- Rice Stink Bugs in Arkansas
- Mosquito Control Around the Home and in Communities
- Bats In and Around Your Home
- Developing a Community Mosquito Abatement Program

When fact sheets are made available for print on demand, county Extension agents are provided a copy and notification.

Extension Program Results and Accomplishments

Output Indicators

53	New and revised fact sheets designed and made available for print-on-demand and for web access.
4	Fact sheets that were designed and printed and made available for web access.
5	Four-color fact sheets that were printed and made available for web access.
14	Fact sheets that were designed for print only.
30	Fact sheets that were designed and placed on the web for web access only.
8	Miscellaneous publications that were designed for web, print-on-demand and offset press. Included are the MPs that are frequently used by county faculty and agriculture producers relative to pesticide and chemical applications.
57	Issues of 18 Extension newsletters directed at targeted clientele, providing timely information based upon current research and knowledge in a variety of areas such fire ant abatement, fruit production, farm management and marketing, beef cattle research update, dairy farming and money management.
16	Brochures supporting the promotion and recruitment of clientele for Extension's educational programs to include workshops and agriculture field days held throughout the state.
23	Program guides used by county faculty in conducting workshops and information for clientele in meeting locally driven educational programs and needs.
3	Weekly news reports that provide timely and dynamic information to producers who subscribe to this service. The titles: Livestock Market Report, Grain Report and Rice Market News.

3,504 The number of orders placed by county faculty for print-on-demand publications for support of educational programs at the county level.

279, 787 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

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 Program, which predicts critical events during the season based upon variety and temperature data.
- Irrigation Scheduling, which uses temperature, rainfall and past irrigation data to predict timing and amount of irrigation.
- Cotton Pheromone Trap Reporting, which compiles reports from insect traps in Arkansas and other states to analyze/graph the degree of infestation.
- Farm Management, an information management tool that organizes soil, water and manure testing, fertilizer and pesticide applications and budget data for producers.
- Soybean and Rice Variety Selections, which recommends the appropriate varieties to plant based upon location, plant date, soil type and disease resistance.
- Rice Seeding Rates, a program that calculates volume of seed needed based upon variety, location, planting date, soil type, seeding method, drill width and seedbed preparation.

The software decision tools are delivered to clientele, in coordination with county Extension offices, as programs to run directly 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.

571 Standalone decision tools delivered in FY 2002.

21 States requesting copies of tools (California, Colorado, Florida, Georgia, Illinois, Indiana, Kansas, Kentucky, Louisiana, Michigan, Mississippi, Missouri, Montana, Nebraska, New Your, Oklahoma, South Carolina, Tennessee, Texas, Wisconsin, Wyoming) in FY 2002.

14 Foreign entities requesting Farm Management tools (Bangladesh, Barbados, Belfast, Dominican Republic, Ecuador, Greece, India, Jordan, Mexico, Panama, Singapore, Spain, Zimbabwe) in FY 2002.

1,654 Rice producers enrolled in the web-based DD50 Rice Management decision tool in FY 2002.

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 date 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, 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 minor 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 redesign of the University of Arkansas Cooperative Extension Service web site, http:///www.uaex.edu, debuted February 1, 2001. More than 10,000 web pages were shifted from a

structure based upon internal departments to one based upon our target audience needs. Teams of Extension specialists, counties and support staff manage the content of the seven areas of focus:

- Arkansas Agriculture, http://www.aragricuture.org
- Arkansas Families, http://www.arfamilies.org
- Arkansas Communities, http://www.arcommunities.org
- Arkansas Businesses, http://www.arbusinesses.org
- Arkansas Home and Garden, http://www.arhomeand garden.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, with a planned migration to Macromedia Dreamweaver. All pages contain requisite menus, toolbars and branding to present a consistent look and feel. Include files are incorporated in the pages to simplify changes in those elements common to all pages.

35,000 Text and image files currently posted on the new site, representing a threefold increase in FY 2002.

Outcome Indicators

– Approximately 9,889,098 visits (hits) accessed information concerning publications, jobs, hot topics, newsletters and other miscellaneous areas in fiscal year 2002.

– Approximately 753,778 visits (hits) accessed information concerning agriculture in fiscal year 2002. Commercial horticulture received the most attention.

– Approximately 554,213 visits (hits) accessed information on homes and gardens in Fiscal year 2002. The popular Ask Janet Carson and Plant of the Week constituted almost half of the visits.

– Approximately 269,692 visits (hits) accessed information on communities in fiscal year 2002. Information provided Arkansans regarding pending tax and ballot issues constituted 62 percent of the visits.

– Approximately 160,413 visits (hits) accessed information on families in fiscal year 2002.

– Approximately 219,639 visits (hits) accessed information on youth in fiscal year 2002.

– Approximately 87,926 visits (hits) accessed information on the environment in fiscal year 2002.

– Approximately 39,497 visits (hits) accessed information on businesses in fiscal year 2002. Information provided for small and home-based businesses represented 46 percent of the visits.

Source of Funds

State operating funds, 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: In-Service Training System

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 provides the link between research and practice. County Extension agents located in every

Arkansas county deliver the educational programs that turn research-based knowledge into real world applications. Extension subject-matter specialists provide the expertise for interpreting the research and training the county faculty in new recommended methods. To maintain the high level of excellence in our educational programs, a management tool was needed to facilitate the enrollment and tracking of in-service training within the organization.

Stakeholder Input

Input was garnered from the following stakeholders:

- Director of Organizational Staff and Leadership Development
- Director of Information Technology
- Southern Region Program Leadership Committee – Communications and Information Technology
- Extension specialists
- County Extension agents
- Administrative support staff

Overview

Evaluation of the situation resulted in three findings:

1. Extension employees needed a tool that would allow them to review available classes, enroll in or drop training, receive timely approval for requested classes and track educational history.

2. Instructors needed a simplified method to determine the roster for each class, notify students of upcoming events and report attendance.

3. Supervisors needed a tool to allow them to review courses taken by each of their employees, approve pending training and be alerted when an employee does not attend an approved class.

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. In-Service Training uses a simplified menu system to list all training available, either by category (4-H, Administration, Agriculture, Financial Services, Communication, Family and Consumer Sciences, Human Resources, Information Technology, or Staff Development) or alphabetically. Employees can request or drop classes and view personal training schedules.

Once an employee enrolls in a class, an e-mail is sent to his/her supervisor. The e-mail contains a hyperlink to the program, where the supervisor can view requested classes for all appropriate staff and approve/deny at one time. If a class is approved, an appointment is sent to the employee's GroupWise calendar. If denied, the employee receives an e-mail alerting them to the action. Supervisors can also review the training schedules for their entire staff, on demand.

Instructors can view planned courses, review student rosters, submit attendance reports and send group e-mails to class participants. If an employee is reported absent, the supervisor of that employee automatically receives an e-mail notification.

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.

140 Number of courses managed in FY 2002.

592 Employees attended one or more classes.

Outcome Indicator

The primary impact of this program is a more highly skilled workforce capable of delivering the research-based educational programs needed in Arkansas. Secondary impacts include improved

management of professional development within the organization. Supervisors now have a tool they can use to help guide faculty and staff as they progress in their careers.

As a result of the program, the number of courses offered approximately doubled, significantly enriching the in-service training of employees. The time between planning an in-service course and announcement of the course offering was reduced from weeks to days. Also, the program improved time management. By placing the training appointments directly on each individual's calendar and by automating notification when a class is missed, absenteeism has declined.

Source of Funds

State operating funds, Smith Lever.

Scope of Impact

Dissemination – With the exception of some temporary and janitorial staff, 100 percent of Extension faculty and staff access the program.

Scope of Program – This program is state specific to Arkansas, but can be exported to other states with minor modifications.

April 2003

FY 2002 Report of Accomplishments and Results

Arkansas Agricultural Experiment Station
Division of Agriculture
University of Arkansas

Introduction

The Arkansas Agricultural Experiment Station is the research arm of the Division of Agriculture, University of Arkansas System. The FY 2002 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:

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Dean, Dale Bumpers College of Agricultural, Food and Life Sciences
Associate Vice President for Agriculture - Research, Arkansas Agricultural Experiment Station
AFLS E 108
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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 growing part of the agricultural economy. Row crop farmers remain at risk due to high input costs and current low commodity prices. 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.

New faculty in agricultural economics have been hired at two of our research and extension centers and will focus on farm level economic issues as farmers continue to adjust to the current low commodity prices for all major row crops.

Animal Systems

Beef and poultry production remain closely linked in Arkansas. Most beef operations are 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 will address 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.

In poultry, 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, multidisciplinary 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 nonfederal 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 have 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 agrimedicine, nutraceuticals and human nutrition.

FY 2002 Expenditures on Goal 1: $39,103,590

KEY THEME: PLANT PRODUCTION EFFICIENCY

Situation

Twelve long and medium grain varieties have been released to the public from the Arkansas rice breeding program since 1980. Each variety comes with management recommendations developed through research on plant nutrients, diseases, insect pests, weeds and other areas. 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-two percent of the rice grown in Arkansas in 2002 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 only 4,110 pounds per acre compared to record high of 6,450 pounds per acre for 2002. Assigning a conservative value of 60 percent of this 2,340 pounds per acre yield increase to new varieties, the average monetary gain in 2002, at a rough rice price of $2.93 per bushel with the loan deficiency payment, was $91 per acre or $140 million for the 1.54 million acres grown in Arkansas, of which some $73 million is due to new Arkansas varieties.

Source of Federal Funds

Hatch, state matching

Scope of Impact

Multistate research (AR, LA, MS)

KEY THEME: PLANT GERMPLASM

Situation

Wheat is an important crop for Arkansas farmers since it is an essential part of the double-cropping system with soybeans. A new, high-yielding, disease-resistant wheat variety "Pat," which was developed in the Arkansas Agricultural Experiment Station small grains breeding program, was made available in the fall of 2002. Pat has excellent winter hardiness and good straw strength. It is resistant to soil-borne wheat mosaic, wheat spindle streak mosaic and stripe rust, and it is moderately resistant to leaf rust. Quality test results for Pat indicate excellent milling and baking characteristics.

Impact

The new wheat variety "Pat" has shown good adaptation at test sites around the state during the last three years of testing, averaging 76.6 bushels per acre. Higher yields from this variety and reduced use of fungicides for this variety should translate into higher net returns for Arkansas wheat producers.

Source of Federal Funds

Hatch, multistate, state matching

Scope of Impact

Multistate research

KEY THEME: INNOVATIVE FARMING TECHNIQUES

Situation

Research has documented that rice fields can be drained much earlier than previously thought possible without reducing grain yield or quality. Guidelines for early cessation of pumping water into rice fields and early draining were developed in conjunction with Cooperative Extension.

Impact

Thousands of dollars are saved by Arkansas and Mississippi rice producers each year by utilizing these research findings in draining rice fields. On many rice farms east of Crowley's Ridge in Arkansas, water and pumping savings equal $10,000 per farm. Another major benefit of terminating irrigation and draining fields earlier is less rutting of fields by combines because the soil is drier during rice harvest. Less rutting of fields reduces land forming costs for the next planting season.

Source of Federal Funds

Hatch, state matching, multistate

Scope of Impact

Multistate research and extension (AR, MS)

KEY THEME: BIOTECHNOLOGY

Situation

The key to producing stable transgenic plants is to precisely integrate the foreign gene in a specific genomic location. Experiment Station scientists have developed a technology that will facilitate just that. This technology is based on a DNA recombination system called Cre-*lox*, which allows the integration of a *lox*-containing foreign DNA into a pre-selected genomic location. Scientists are currently testing this technology for producing stable transgenic rice. Several transgenic rice plants have already been produced. The stability of the foreign gene is under investigation.

Impact

The development of this novel technology will allow the production of stable transgenic plants at much lower cost. Any type of transgenic plant, herbicide-resistant, disease-resistant and value-added crops, which will be suitable for breeding programs can be produced.

Source of Federal Funds

Hatch, state matching

Scope of Impact

Multistate research

KEY THEME: PLANT HEALTH

Situation

Research has shown that spores of the rice blast fungus can survive on infected seeds harvested from the year before, and that if these seeds are planted in the following year, they can be a source of the disease. Furthermore, if seeds are left on the surface of the fields, the epidemics appear earlier and can be more severe before plants are ready for harvesting. Even if seeds are planted into the soil and not left on the surface, they still can provide the means for an epidemic to begin.

Impact

Infected rice seeds can provide the means for rice blast epidemics, and it helps to explain how the rice blast fungus survives. Further, it suggests that planting seed free of blast infection reduces the severity of the disease in cultivars that are not completely resistant to this disease. This has the potential impact of reducing the producer's costs and increasing yields. In one year, losses were cut in half simply by planting clean seed.

Source of Federal Funds

Hatch, state matching, multistate

Scope of Impact

Multistate research (AR, MS, LA)

KEY THEME: INVASIVE SPECIES

Situation

Entomologists are developing an experimental threshold to increase reliance on natural enemies in the decision-making process for applying insecticides to control the cotton aphid during the early season. Scientists are implementing this new threshold in demonstration plots throughout the state to evaluate and refine the threshold for commercial cotton fields.

Impact

Research demonstrated that using estimates of rates of parasitism and coccinellid density (adults and larvae), insecticide applications could be delayed or eliminated without yield consequences. In 1999 and 2000, insecticide applications were reduced in half (from 2 to 1) using this threshold. In 2001, aphid populations were much smaller, and use of the experimental threshold eliminated the single aphicide applied to plots under the conventional threshold.

Source of Federal Funds

Hatch, state matching, NRI

Scope of Impact

Multistate research

KEY THEME: ANIMAL HEALTH

Situation

Arkansas research and extension personnel assist the poultry industry and producers with disease diagnosis and control. The University of Arkansas participates in state and regional efforts with other agencies on the Arkansas Animal Emergency Disease Response team (AAEDR) and Emergency Poultry Disease committee (EPD). These teams and committees are responsible for educating producers and individuals about disease prevention and biosecurity; assisting in preparing guidelines for the industry as related to disease outbreaks; and conducting seminars, "mock outbreak drills" and training sessions on disease outbreaks. An Arkansas extension poultry health veterinarian served on a special USDA task force fighting an Avian Influenza outbreak in Virginia.

Impact

The improvement in disease recognition by the poultry producer allows faster implementation of control procedures. In addition, the continued improvement of biosecurity protocols allows for better disease protection of a flock by reducing the exposure risk.

Source of Federal Funds

Hatch, state matching

Scope of Impact

State-specific

KEY THEME: ANIMAL HEALTH

Situation

Dietary supplementation of broiler diets with dead-bacterial cell powder derived from *Escherichia coli* greatly enhanced the activity of macrophages, an immune cell that plays an

important role in both natural and specific immunity. Moreover, it was found that *E. coli* dead-bacterial cell powders added to the diet increased the clearance of orally administered Salmonella bacteria from organs.

Impact

Optimizing poultry health with dietary immunostimulants can substantially decrease poultry losses due to disease and intensive production and management practices.

Source of Federal Funding

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: PASTURE MANAGEMENT

Broiler litter, which is commonly applied to pastures as a grass fertilizer, contains plant minerals needed by grazing beef cattle. Continuous fertilization with broiler litter might reduce the need for supplemental minerals for cattle grazing the pastures, and thereby reduce production costs for Arkansas cattlemen.

Impact

Beef cattle producers who have a history of broiler litter application should not need to spend extra money purchasing mineral supplements with phosphorus, but should supplement their spring-calving cows with additional magnesium during the spring grass-tetany season. By substituting salt-based mineral supplements containing copper for complete mineral supplements containing calcium and phosphorus, cattlemen could save in excess of $20 per cow annually.

Source of Federal Funding

Hatch, NRI, state matching

Scope of Impact

Multistate

KEY THEME: ANIMAL PRODUCTION EFFICIENCY

Situation

Arkansas scientists developed a technique for injecting micro-particles into the bloodstream as a method for selecting broiler lines that have a genetically improved cardio-pulmonary capacity.

Impact

Micro-particle injections provide broiler geneticists with an efficient technique for rapidly eliminating individual birds that have an inadequate pulmonary vascular capacity. The surviving broilers will possess a robust cardio-pulmonary capacity that conveys parallel resistance (increased growth performance, reduced mortality) during exposure to either cold temperatures or heat stress. Broiler growers will benefit from improved livability accompanied by improved flock growth performance.

Source of Federal Funding

Hatch, state matching

Scope of Impact

Multistate

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 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 in a coordinated research effort. 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 2002 Expenditures for Goal 2: $4,154,585

KEY THEME: FOOD SAFETY

Situation

Arkansas Agricultural Experiment Station scientists provided leadership to organize and operate the National Alliance for Food Safety (NAFS). The NAFS was formed in November, 1998; it includes 19 universities and three USDA agencies; the Agricultural Research Service (ARS), the Food Safety and Inspection Service (FSIS), and the Cooperative State, Research, Education and Extension Service (CSREES). The mission is to continually improve the safety of our food supply to ensure the public's health and to enhance our national and international food supply. The NAFS is organized in 12 Virtual Centers, six of which are commodity-based and six of which are discipline-based. The commodity-based centers are beef, dairy, plant, pork, poultry and seafood/aquaculture. The discipline-based centers are detection and typing methods, education and outreach, food toxicology, microbial physiology and ecology, pathogen control and risk analysis and policy.

Impact

The NAFS conducted the third-party review of the experimental design, data collection/analysis and conclusions of the HACCP-Based Inspection Models Project (HIMP), which was originally prepared by RTI, Inc., for the USDA-FSIS. The review recommendations will be used in guiding policy decisions of the FSIS regarding meat and poultry inspection systems.

Source of Federal Funding

Hatch, state matching, USDA-Special Grants

Scope of Impact

Multistate

KEY THEME: FOOD SECURITY

Situation

Station scientists developed a simple, direct plating method to determine not only the incidence but also the numbers of ciprofloxacin-sensitive and resistant Campylobacter present on foods. Concentrated rinses from foods such as retail poultry are directly plated onto a selective medium containing this antibiotic. Over a four-month sampling period, total Campylobacter counts on whole chicken carcasses sampled at retail ranged from 0 to 9,900 colony-forming units (CFU) per carcass. The counts of Campylobacter microcolonies isolated in the presence of 10 or 20 *g/ml of ciprofloxacin were 0 to 3,800 or 0 to 160 CFU per carcass, respectively.

Impact

The direct plating system developed in this research is a simple, powerful, user-friendly and quantitative method to determine not only the incidence but also the numbers of bacteria on foods that are resistant to antibiotics like ciprofloxacin. The methods described make it more possible to monitor the persistence and destruction of pathogens such as Campylobacter during processing.

Scope of Impact

Multistate

KEY THEME: FOOD SAFETY

Situation

Electrolyzed water (EW) as a dipping treatment for fresh, raw vegetables including broccoli, lettuce, tomato and sprouts is an effective method of destroying pathogenic bacteria on the vegetables. The color and texture of fresh vegetables remain unchanged after the EW treatment.

Scope of Impact

Multistate

KEY THEME: FOODBORNE PATHOGEN PROTECTION

Situation

Using pulsed-field gel electrophoresis, Arkansas scientists constructed a DNA database of *Campylobacter jejuni* strains isolated from pre-chill chicken carcasses, post-chill chicken carcasses, whole chicken carcasses purchased at retail and humans. Analysis of these data suggest that since human isolates possess a higher overall level of cytotoxicity than the isolates obtained from chicken carcasses, cytotoxicity may be a primary pathogenicity factor in determining virulence of wildtype *Campylobacter jejuni*.

Impact

Many outbreaks of foodborne pathogens result from exposure to a common source. By providing accurate information concerning specific DNA evidence on the source of the foodborne bacteria, food companies will benefit economically by being able to pinpoint areas and situations in their food processing that are sources of potential foodborne bacteria. Thus, the companies will have a higher probability of correcting these problems and providing a safer product for the consumer.

Source of Federal Funding

Hatch, state matching, USDA-Special Grants

Scope of Impact

Multistate

KEY THEME: FOODBORNE ILLNESS

Situation

Arkansas Agricultural Experiment station scientists developed a multiplex PCR assay that is specific for the detection of *Campylobacter jejuni, Salmonella*, *Escherichia coli* 0157:H7, and *Listeria monocytogenes.* This was accomplished by combining PCR primers for detection of *C. jejuni* with published primers for the other three pathogens. Scientists have developed food sampling methods that are compatible with the PCR assay and are determining the efficacy and sensitivity of the mulitplex PCR assay in a variety of food products.

Impact

A rapid PCR assay for detecting low numbers of all four organisms was developed. The assay will be beneficial not only in reducing the time in which appropriate measures could be taken to remove contaminated food from consumers, but also in reducing the time of diagnosis and treatment. It would also allow outbreaks to be properly followed, thus allowing researchers to better understand the health risks associated with these genera of bacteria.

Source of Federal Funding

Hatch, state matching, USDA Special Grants

Scope of Impact

Multistate

KEY THEME: HACCP

Situation

Arkansas entomologists developed a multiplex PCR assay that will identify *Campylobacter*, *Salmonella*, and *E. coli* O157:H7 from DNA extracted from filth flies associated with poultry. Approximately 5,000 filth flies were collected within and among turkey brooder and finishing houses in Northwest Arkansas during the late spring and early summer of 2002. Of the 231 stable flies, black dump flies, lesser house flies and house flies that have been analyzed so far, 58 flies were positive for *Campylobacter*, 2 for *Salmonella*, and 9 for *E. coli* O157:H7.

Impact

This research provides the first documented evidence that stable fly, lesser house fly, house fly and black dump fly carry *Campylobacter* in the poultry environment, and that house flies and lesser house flies carry *E. coli* O157:H7 in the same environment. Recent human deaths caused by the release of *Bacillus anthracis* and threats of biological warfare warrant attention to rapid identification of pathogens in the human and food animal environment. The greatest benefit of this procedure is the rapid detection of pathogen contamination among arthropod reservoirs in 6 hours or less from DNA extraction to final pathogen identification.

Source of Federal Funding

Hatch, state, USDA-Special Grants

Scope of Impact

Multistate

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 2002 Expenditures for Goal 3: $855,562

KEY THEME: HUMAN HEALTH

Situation

Arkansas scientists are studying the correlation of anti-oxidative enzyme activities, nutritional status and smoking in different age groups to better identify diagnostic and therapeutic methods for the treatment and prevention of tobacco-related illnesses.

Impact

The direct beneficiary from this research will be smokers. Long-term smoking is known to be associated with an increased risk of developing cancer, cardiovascular disease, and many other chronic diseases. Cigarette smoke contains a large number of oxidants that may cause oxidative damage and a large amount of free radicals that could directly initiate and propagate the process of lipid peroxidation. The economic impact will include lower healthcare costs that may result from smoking related illnesses and possibly diseases usually found in the aging population.

Source of Federal Funding

Hatch, state matching

Scope of Impact

Multistate Research

KEY THEME: NUTRACEUTICALS

Situation

Arkansas Agricultural Experiment Station scientists have developed an enzymatic process to produce rice protein isolate from rice bran. Various carbohydrases and proteases were screened, and two enzymes were selected to produce the isolate. The first enzyme digests the cellulosic material and releases the protein, while the second enzyme nicks protein under controlled conditions and solubilizes the protein.

Impact

The new method to produce rice bran protein will be useful for the rice processors to develop and produce new nutraceutical and functional products from rice bran. The rice bran protein will be in demand by the consumer due to its health benefit. Rice bran protein isolate will add value to a low priced co-product of rice.

Source of Federal Funding

Hatch, state matching

Scope of Impact

Multistate

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 2002 Expenditures for Goal 4: $6,331,210

KEY THEME: SUSTAINABLE AGRICULTURE

Situation

Arkansas researchers have developed MARORA, a farm-level irrigation system model to evaluate the economics of on-farm reservoirs and other water conservation practices. MARORA is a user-friendly computer model that allows the producer to estimate the costs and benefits of investing in an on-farm reservoir and tail water recovery system or adopting water-conserving practices. The producer may specify MARORA to evaluate alternative ground water conditions, cropping systems and other factors that affect the profitability of irrigated agriculture. MARORA tabulates the surface water runoff on the farm and from other off-farm sources and compares the cost of using surface water with the use of ground water for irrigation. The value of water conservation improvements in the field such as underground pipes, multiple-inlet delivery and precision leveling can be assessed with MARORA for both ground water use and for surface water use from on-farm reservoirs.

Impact

Producers of irrigated crops in areas where ground water is being depleted can use MARORA to help determine the value of investing in on-farm reservoirs. Many producers in eastern Arkansas are encountering constraints not only in the quantity of irrigated water but also quality of the water. On-farm reservoirs can improve water quality in addition to reducing the demand for ground water. Tail water recovery systems limit sediment losses into streams and rivers, in addition to saving water.

Source of Federal Funding

Hatch, state matching, U.S. Geological Survey

Scope of Impact

Multistate (AR, MS, LA)

KEY THEME: WATER QUALITY

Situation

Arkansas scientists evaluated the impact of varying spatial resolution of input data for topography (e.g., Digital Elevation Model, DEM), land use and soils, on the uncertainty of flow, sediment, nitrate nitrogen and total phosphorus transport predicted by the Soil and Water Assessment Tool (SWAT) model. Inputs included measured hydrologic, meteorologic, watershed characteristics and water quality data from Moore's Creek watershed in Washington County, Arkansas. The SWAT model output was most affected by input DEM data resolution. A coarser DEM data resolution resulted in decreased representation of watershed area and slope and increased slope length.

Scope of Impact

Multistate (AR, OK, MO)

KEY THEME: SUSTAINABLE AGRICULTURE

Situation

Arkansas scientists are analyzing the profitability and risks associated with earlier-than-conventional rice irrigation termination within a rice-soybean production system. An assumption is that the typical farm will be constrained from irrigating all its soybean acres due to constraints in water supply, pumping capacity and/or labor availability. In these cases, a portion of the soybean acreage would be non-irrigated until irrigation water is transferred to the soybean crop after the needs of the rice crop are met. Forty-one years of weather data were used to predict soybean irrigation starting dates in conjunction with SOYGRO, a soybean simulation software that can estimate partially irrigated soybean yields for two maturity groups (IV and V).

Impact

This research aids producers in determining optimal planting date and soybean cultivar selections. If rice and soybean planting dates are planned optimally, this partial irrigation can lead to increased soybean yields and a more profitable rice/soybean production system. When using optimal planting dates, an increase in soybean yields of over 10 bushels per acre is achieved more than 90 percent of the time. The additional cost of irrigating the soybean crop was estimated to be approximately $7.03 per acre in setup costs plus $4.06 per acre for each irrigation. Averaging across the 41 weather years, partial irrigation of soybeans resulted in consistently positive returns ranging from $17 to $185 per acre.

Source of Federal Funding

Hatch, state matching

Scope of Impact

Multistate

KEY THEME: SOIL QUALITY

Situation

Phytoremediation is being conducted near El Dorado, Arkansas, at a crude oil storage/separation facility that was the site of a spill in 1997. Vegetated fertilized treatments significantly lower Total Petroleum Hydrocarbon (TPH) levels compared with control plots with reductions of 59 and 39 percent, respectively. The vegetated fertilized treatments also have lower levels of the more toxic compounds found in weathered crude oil compared with the control plots and have higher levels of bacteria, fungi and oil-degrading microorganisms. The grasses exhibited excellent shoot and root biomass growth in the oil-contaminated soil when fertilizer was supplied and appear to be beneficial in the remediation of the site.

Impact

Phytoremediation offers a less expensive alternative to return contaminated sites to productive use. Cost estimates show that treatment of crude oil-contaminated soil by traditional methods such as excavation and landfilling or incineration are from two to ten times more expensive than phytoremediation. By using the more economical phytoremediation method, oil producers can reduce cleanup costs and remove many sources of potential environmental pollution.

Source of Federal Funding

Hatch, state matching, U.S. EPA

Scope of Impact

Multistate

KEY THEME: FOREST RESOURCE MANAGEMENT

Situation

Researchers at the Arkansas Forest Resources Center teamed with members of industry (Georgia Pacific Corporation and Plum Creek Timber Company, Inc.) and contracted logging crews to measure and weigh loblolly pine sawtimber trees of varying sizes. The researchers then developed a set of equations and tables that can be used to estimate the weight of wood present in loblolly pine sawtimber trees. The equations and tables were developed such that they can easily be applied to trees using measures common to any forest inventory.

Impact

The need to convert from board feet to tons in order to determine the value of loblolly pine sawtimber trees has been eliminated. Loblolly pine sawtimber inventories can now be inventoried directly in tons, the prevalent metric for buying and selling such timber, using the tables and equations developed by the researchers. Landowners and land managers alike no longer need to worry about any conversion procedure and, hopefully far fewer disagreements and potential lawsuits will result.

Source of Federal Funding

McIntire-Stennis, state matching, USDA Special-Grants

Scope of Impact

Multistate

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

Situation

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 is 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 2002 Expenditures for Goal 5: $2,238,458

KEY THEME: PROMOTING BUSINESS PROGRAMS

Siltuation

The Global Marketing Support Services (GMSS) program was established in 1993 by the Arkansas Agricultural Experiment Station. GMSS provides export assistance to Arkansas' small to medium-sized businesses through personalized training, one-on-one consulting, customized market research, in-country competitive market analysis and written publications. GMSS works closely with state and federal programs and educates Arkansas firms about assistance that is available to them through the various resources. Each client receives information on a range of topics such as global pricing, shipping issues, development of an international marketing plan and overseas contacts.

Source of Federal Funding

Hatch, state matching

Scope of Impact

State specific

KEY THEME: JOBS/ENFORCEMENT

Situation

The total impact (direct, indirect and induced effects) of agriculture (production and processing for crop, livestock and forestry) on value added, employment and wage income was estimated for the latest year data are available, 1999. Agriculture is responsible for the creation of over 20 percent of the state's jobs, 20 percent of the state's value added and 15 percent of the state's total payroll. Agriculture generates value added, employment and wages in all 51 of the study sectors, but much of what is gained goes to wholesale and retail trade, financial/real estate, miscellaneous services, transportation and communication services and health services.

Impact

The vital importance to Arkansas' economy, particularly rural areas of the state with limited alternatives for economic activity and growth, is highlighted by the strong indirect and induced impacts on associated industrial and human service sectors. Governmental and business personnel and policymakers were assisted in deciding upon and pursuing appropriate and positive courses of action that directly and indirectly affect the agricultural and rural communities of Arkansas.

Source of Federal Funding

Hatch, state matching

Scope of Impact

State specific research and extension

KEY THEME: CHILDREN, YOUTH AND FAMILIES AT RISK

Situation

Despite concern about drug abuse in society, research specifically targeting drug-addicted women is sparse. Women's drug abuse often occurs in the context of an intimate couple relationship. The Arkansas Agricultural Experiment Station participated in a study of relationship adjustment and drug use over 18 months as reported by 115 drug-abusing women and their male partners.

Impact

A major finding was that treatment did not reduce women's drug use. Women's drug use did not change over time. Mounting evidence from this study and others suggests that couples therapy does not substantially reduce women's drug use over time. However, research does show that couples therapy works to reduce men's drug abuse. The second finding relates to the connection between drug abuse and relationship quality. Do poor quality relationships cause drug abuse? Or, does drug abuse cause poor quality relationships? Cross-domain growth modeling found little or no relationship between drug abuse and relationship adjustment for women. Third, this research suggests that poverty and domestic violence are causally linked to women's drug abuse. As a society, if we can reduce women's poverty and domestic violence, perhaps we can reduce women's drug abuse.

Source of Federal Funding

Hatch, state matching, National Institute on Drug Abuse

Scope of Impact

Multistate

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 on 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 some 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.